

ACIDIC PRECIPITATION  
IN ONTARIO STUDY

CUMULATIVE (28 DAY)  
PRECIPITATION CHEMISTRY LISTINGS  
JANUARY 3, 1984 – JANUARY 2, 1985

December, 1985

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1985



Ministry  
of the  
Environment

Dr. David Balsillie, Director  
Air Resources Branch

**ACIDIC PRECIPITATION IN ONTARIO STUDY**

**CUMULATIVE (28 DAY) PRECIPITATION CHEMISTRY LISTINGS  
JANUARY 3, 1984 - JANUARY 2, 1985**

**Atmospheric Processes Studies Unit  
Air Quality and Meteorology Section  
Air Resources Branch  
Toronto, Ontario  
Canada, M5S 1Z8**

**December 1985**

**A.P.I.O.S. Coordination Office  
Ontario Ministry of the Environment  
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| <u>Station Name</u> | <u>Map Ref. No.</u> | <u>Page</u> |
|---------------------|---------------------|-------------|
| Alvinston           | 05                  | 1           |
| Colchester          | 01                  | 4           |
| Huron Park          | 06                  | 7           |
| Merlin              | 02                  | 10          |
| Palmerston          | 08                  | 13          |
| Port Stanley        | 03                  | 16          |
| Shallow Lake        | 09                  | 19          |
| Waterloo            | 07                  | 22          |
| Wilkesport          | 04                  | 25          |

**PART IV      CENTRAL REGION CUMULATIVE  
PRECIPITATION CHEMISTRY LISTINGS**

| <u>Station Name</u> | <u>Map Ref. No.</u> | <u>Page</u> |
|---------------------|---------------------|-------------|
| Campbellford        | 13                  | 28          |
| Coldwater           | 12                  | 31          |
| Dorset              | 20                  | 34          |
| Milton              | 10                  | 37          |
| Uxbridge            | 11                  | 40          |
| Wilberforce         | 18                  | 43          |

**PART V      SOUTHEASTERN REGION CUMULATIVE  
PRECIPITATION CHEMISTRY LISTINGS**

| <u>Station Name</u> | <u>Map Ref. No.</u> | <u>Page</u> |
|---------------------|---------------------|-------------|
| Cloyne              | 14                  | 46          |
| Dalhousie Mills     | 16                  | 49          |
| Golden Lake         | 17                  | 52          |
| Smith's Falls       | 15                  | 55          |



**PART VI      NORTHEASTERN REGION CUMULATIVE  
PRECIPITATION CHEMISTRY LISTINGS**

| <u>Station Name</u> | <u>Map Ref. No.</u> | <u>Page</u> |
|---------------------|---------------------|-------------|
| Attawapiskat        | 28                  | 58          |
| Azure Lake          | 26                  | 61          |
| Bear Island         | 24                  | 64          |
| Gowganda            | 25                  | 67          |
| Killarney           | 23                  | 70          |
| Mattawa             | 22                  | 73          |
| McKellar            | 21                  | 76          |
| Moonbeam            | 27                  | 79          |
| Turkey Lake         | 37                  | 82          |
| Whitney             | 19                  | 85          |

**PART VII      NORTHWESTERN REGION CUMULATIVE  
PRECIPITATION CHEMISTRY LISTINGS**

| <u>Station Name</u> | <u>Map Ref. No.</u> | <u>Page</u> |
|---------------------|---------------------|-------------|
| Dorion              | 31                  | 88          |
| Ear Falls           | 35                  | 91          |
| Exp. Lakes Area     | 34                  | 94          |
| Geraldton           | 30                  | 97          |
| Lac La Croix        | 33                  | 100         |
| Otter Island        | 38                  | 103         |
| Pickle Lake         | 36                  | 106         |
| Quetico Centre      | 32                  | 109         |
| Winisk              | 29                  | 112         |

PART I

INTRODUCTION

## **INTRODUCTION**

The data listed herein are a summary of the results acquired from the APIOS cumulative precipitation sampling network from January 3, 1984 to January 2, 1985. The sampler utilized for collection of wet cumulative deposition is the M.I.C. Type "A" collector (Sangamo). During May to October when precipitation is mainly in the form of rain, the Sangamo collector is equipped with a 34 cm x 61 cm polyethylene bag insert. For snow and snow/rain collection from November to April, deeper collection vessels are utilized (122 cm) with 34 cm x 122 cm polyethylene bag inserts. The deeper collection vessel is utilized to reduce snow blow out. The period of accumulation per sample is 28 days.

All data presented in this report have been screened for validity. Remarks and qualifications have been appended to records, and/or results where necessary. The screening procedure involved checking each record for chemical analysis integrity (e.g. ionic balance, observed vs. theoretical conductance). Gross limits checks were applied to the results. Upper limits were determined as  $M + 2S$  where median (M) and scale (S) represent robust estimates of mean and standard deviation respectively. Scale of the distribution was estimated from interquartile distance, i.e.  $S=0.74$  (3rd quartile - 1st quartile) based upon logarithmically transformed results. In a situation where the distribution is significantly bounded by reported detection limits, S may be estimated as follows,  $S=1.48$  (3rd quartile - 2nd quartile). All lower gross limits were specified as zero. The data were also screened for outliers statistically by applying the Dixon Ratio test to the highest and lowest values observed in each region on a monthly basis. Outliers were determined at the 95% level of confidence. Records and/or results deemed unreliable are flagged but not deleted. Detailed description of the validation procedures as applied to this data set is available from the Ministry upon request.

### **Station Identification**

The station identification is defined by four descriptive fields (e.g., Dorest/Cumulative/Wet #20). The first field refers to the sampling location. The second and third fields describe the sampling interval and the sampling type (e.g., wet or dry) respectively. The last numeric field refers to the index code utilized on the location map. All precipitation chemistry listings are given in alphabetic order by station name within each region.

### **Cumulative Precipitation Chemistry Listings**

Sample type, as coded in the data listings, represents the state of the collected sample at time of removal. The sample date represents the date on which the sample was removed from the sampler. All chemical analyses were done on unfiltered samples. Lab pH entries represent pH measurements obtained at the MQE Laboratory in Toronto. Reported total hydrogen ion concentration ( $\text{mg l}^{-1}$ ) represents a titration of the sample with NaOH to an end point pH of 8.3. For a complete outline of lab analytical methodology please consult the Ontario Ministry of the Environment report "Outlines of Analytical Methods" coordinated by Water Quality Section, Laboratory Services Branch, June 1981.

Of the reported metals, aluminum, copper, iron and zinc were found to display significant adsorptive losses. As a result, a leach solution of 5% HNO<sub>3</sub> (1 litre) is placed in the emptied collection bag for 24 hours. The leach solution is then analysed for the above metals and a final metal concentration is then calculated. In the calculation of final metal concentration, if a detection limit is encountered, a value corresponding to one half the detection limit is utilized.

Co-located with each sampler is a cumulative precipitation gauge which serves as a primary standard of precipitation during the collection period. However, if the cumulative gauge depth is missing or is thought to be inaccurate, then an approximate precipitation depth is determined. The approximation is made by accumulating three surrounding CLIMAT\* station daily depth gauge results individually and then interpolating linearly to the APIOS station. Sometimes precipitation gauge results could not be calculated by the above method, in which case the data are missing in the tables to follow.

#### Calculation of Equivalent Precipitation Depth (mm)

$$\text{Equivalent Precipitation Depth (mm)} = \frac{\text{Volume Collected (ml)} \times 30.8}{1000}$$

#### Calculation of Observed Sampling Efficiency

$$\% \text{ Efficiency} = \frac{\text{Equivalent Precipitation Depth (mm)} \times 100 \%}{\text{Gauge Depth (mm)}}$$

#### Field Comment Code Index

- A - Insects in sample
- B - Leaves in sample
- C - Particulates in sample
- D - Fibres in sample
- E - Sample not submitted
- F - Sampler malfunctioned
- G - Sample spilled or leaked
- H - Volume incorrect
- I - Event(s) missed
- J - Wet side open when not precipitating
- K - No precipitation collected
- L - Part of event missed
- M - Dry side open when precipitating
- P - Gauge depth incorrect
- Q - Other

---

\* Environment Canada, Atmospheric Environment Service Meteorological Observations in Eastern Canada, Monthly Record

**Office Comment Code Index**

- C - calculated/observed conductance discrepancy
- H - calculated/observed pH discrepancy
- J - pH large
- M - poor ionic balance
- N - abnormal sampler efficiency
- T - free hydrogen exceeds total hydrogen
- X - sample lost

**Analytical Result Remark Code Index**

- actual result greater than value reported
- actual result less than value reported
- T - actual result less than criterion of detection
- W - no response, minimum possible result reported
- A - approximate value
- U - unreliable result
- L - bag leach result not available
- L - bag leach result not available and precipitation  
sample result has been reported as a detection limit
- G - exceedance of gross limit checks
- D - outlier of Dixon Ratio Test
- B - exceedance of gross limit checks and outlier of  
Dixon Ratio Test

PART II

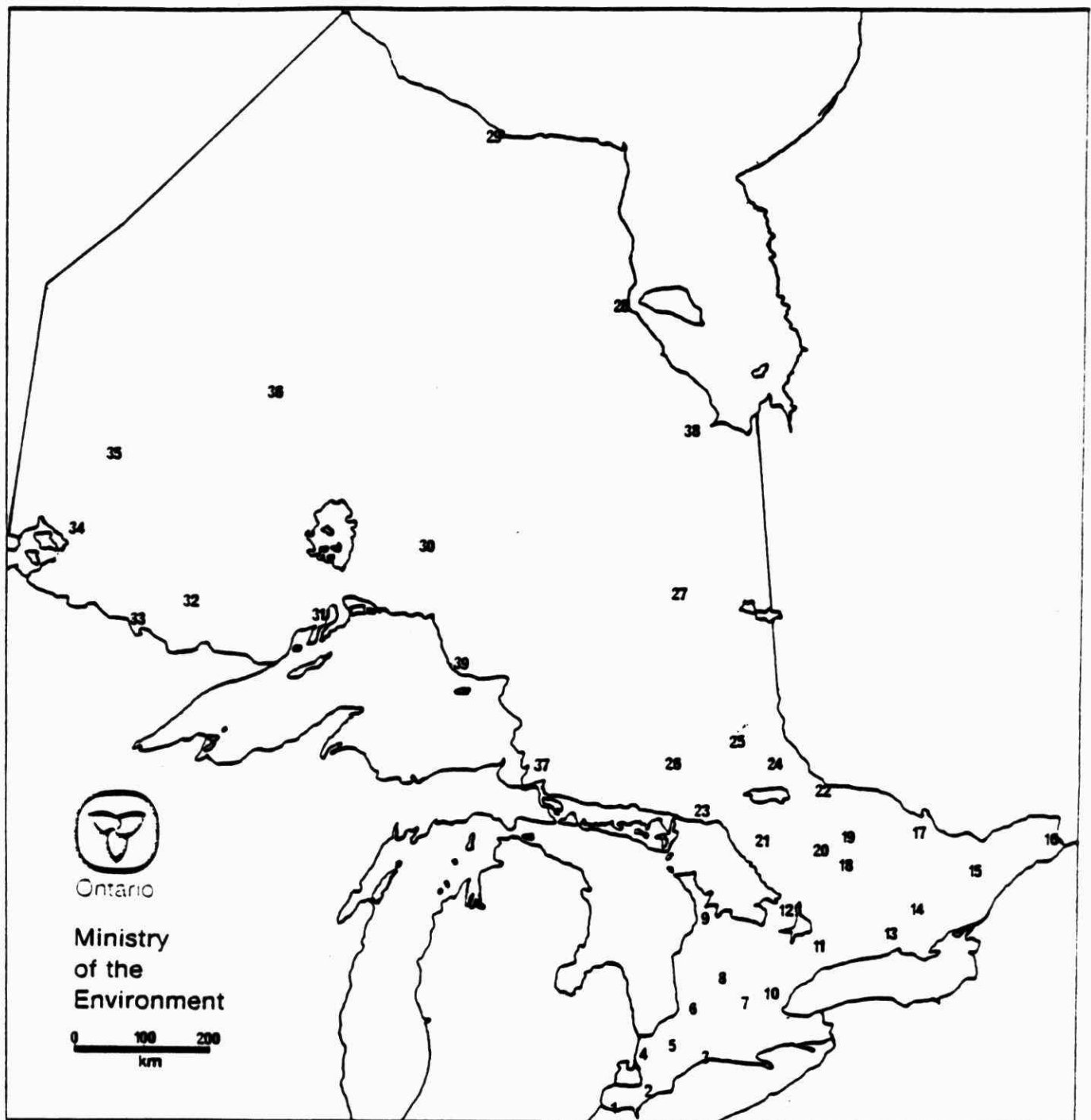
STATION DESCRIPTION AND LOCATION MAP

# APIOS CUMULATIVE WET DEPOSITION NETWORK SITE DESCRIPTIONS

| <u>MOE REGION</u> | <u>STATION NAME</u> | <u>ELEVATION</u><br>(m above MSL) | <u>LATITUDE</u><br>(North) | <u>LONGITUDE</u><br>(West) | <u>UTM GRID CO-ORDINANTS</u> |           |
|-------------------|---------------------|-----------------------------------|----------------------------|----------------------------|------------------------------|-----------|
|                   |                     |                                   |                            |                            | (Northing)                   | (Easting) |
| Southwestern      | Colchester          | 183                               | 41°59'15"                  | 82°55'41"                  | 4650000                      | 340300    |
|                   | Merlin              | 191                               | 42°14'47"                  | 82°13'30"                  | 4676400                      | 398950    |
|                   | Pt. Stanley         | 213                               | 42°40'22"                  | 81°09'55"                  | 4724050                      | 486700    |
|                   | Wilkesport          | 183                               | 42°42'11"                  | 82°21'13"                  | 4728350                      | 389150    |
|                   | Alvinston           | 221                               | 42°49'36"                  | 81°50'04"                  | 4942000                      | 431550    |
|                   | Shallow Lake        | 229                               | 44°34'54"                  | 81°05'24"                  | 4936200                      | 492850    |
|                   | Palmerston          | 389                               | 43°48'19"                  | 80°54'12"                  | 4850050                      | 507750    |
|                   | Huron Park          | 250                               | 43°17'28"                  | 81°30'03"                  | 4793000                      | 459350    |
|                   | Waterloo            | 343                               | 43°28'39"                  | 80°35'09"                  | 4813750                      | 533500    |
| Central           | Dorset              | 320                               | 45°13'26"                  | 78°55'52"                  | 5009650                      | 662400    |
|                   | Milton              | 221                               | 43°31'05"                  | 79°55'54"                  | 4818600                      | 586350    |
|                   | Uxbridge            | 244                               | 44°12'46"                  | 79°12'38"                  | 4896800                      | 643000    |
|                   | Wilberforce         | 396                               | 45°00'54"                  | 78°12'58"                  | 4988150                      | 719400    |
|                   | Campbellford        | 175                               | 44°17'28"                  | 77°47'33"                  | 4907600                      | 277150    |
|                   | Coldwater           | 280                               | 44°37'31"                  | 79°32'08"                  | 4942200                      | 615900    |
| Southeastern      | Smith's Falls       | 122                               | 44°56'41"                  | 75°57'48"                  | 4977100                      | 423950    |
|                   | Dalhousie Mills     | 69                                | 45°19'00"                  | 74°28'13"                  | 5018100                      | 541550    |
|                   | Golden Lake         | 160                               | 45°36'48"                  | 77°12'03"                  | 5053200                      | 328400    |
|                   | Cloyne              | 259                               | 40°49'09"                  | 77°11'45"                  | 4964750                      | 327100    |
| Northeastern      | McKellar            | 244                               | 45°30'57"                  | 79°55'19"                  | 5040600                      | 583950    |
|                   | Killarney           | 183                               | 45°59'26"                  | 81°29'18"                  | 5092900                      | 462200    |
|                   | Mattawa             | 198                               | 46°16'45"                  | 78°49'19"                  | 5127150                      | 667800    |
|                   | Bear Island         | 305                               | 46°58'22"                  | 80°04'40"                  | 5202400                      | 570350    |
|                   | Ramsey              | 427                               | 47°26'33"                  | 82°20'14"                  | 5254900                      | 399200    |
|                   | Azure Lake          | 244                               | 47°28'12"                  | 81°52'30"                  | 5257650                      | 434250    |
|                   | Gowganda            | 343                               | 47°39'04"                  | 80°46'32"                  | 5277300                      | 516600    |
|                   | Moonbeam            | 244                               | 49°19'16"                  | 82°08'46"                  | 5463600                      | 416650    |
|                   | Turkey Lake         | 472                               | 47°03'15"                  | 84°24'00"                  | 5214250                      | 696750    |
|                   | Attawapiskat        | 9                                 | 52°56'00"                  | 82°24'00"                  | NA                           | NA        |
| Northwestern      | Whitney             | 412                               | 45°32'21"                  | 78°15'35"                  | 5045950                      | 713950    |
|                   | Dorion              | 244                               | 48°50'33"                  | 88°36'45"                  | 5410800                      | 382150    |
|                   | Nakina              | 320                               | 50°10'38"                  | 86°42'40"                  | 5558150                      | 520950    |
|                   | Geraldton           | 351                               | 49°48'05"                  | 86°46'00"                  | 5516300                      | 516750    |
|                   | Ear Falls           | 350                               | 50°38'31"                  | 93°13'13"                  | 5609800                      | 484150    |
|                   | Pickle Lake         | 360                               | 51°27'41"                  | 90°12'04"                  | 5704800                      | 694550    |
|                   | Lac la Croix        | 368                               | 48°21'14"                  | 92°12'32"                  | 5355900                      | 558400    |
|                   | Quetico Centre      | 420                               | 48°44'24"                  | 91°12'08"                  | 5399750                      | 632100    |
|                   | E.L.A.              | 123                               | 49°39'22"                  | 93°43'28"                  | 5500950                      | 447350    |
|                   | Winisk              | 9                                 | 55°12'00"                  | 85°08'00"                  | NA                           | NA        |
|                   | Otter Island        | 204                               | 48°06'50"                  | 86°04'25"                  | 5328750                      | 569500    |

**FIGURE 1**

**LOCATION OF APIOS CUMULATIVE WET/DRY DEPOSITION NETWORK SITES**



- |                                 |                               |                                 |
|---------------------------------|-------------------------------|---------------------------------|
| 1. Colchester*                  | 15. Smith's Falls*            | 29. Winisk                      |
| 2. Merlin                       | 16. Dalhousie Mills*          | 30. Geraldton*                  |
| 3. Pt. Stanley*                 | 17. Golden Lake*              | (replacing Nakina, August 1983) |
| 4. Wilkesport*                  | 18. Wilberforce               | 31. Dorion*                     |
| 5. Alvinston                    | 19. Whitney                   | 32. Quetico Centre*             |
| 6. Huron Park                   | 20. Dorset*                   | 33. Lac la Croix                |
| 7. Waterloo                     | 21. McKellar*                 | 34. Experimental Lakes Area     |
| 8. Palmerston*                  | 22. Mattawa*                  | 35. Ear Falls*                  |
| 9. Shallow Lake*                | 23. Killarney*                | 36. Pickle Lake*                |
| 10. Milton (removed March 1984) | 24. Bear Island               | 37. Turkey Lake*                |
| 11. Uxbridge*                   | 25. Gowganda*                 | 38. Moosonee*                   |
| 12. Coldwater                   | 26. Azure Lake                | (installed October, 1985)       |
| 13. Campbellford*               | (replacing Ramsey, June 1983) | 39. Otter Island*               |
| 14. Cloyne*                     | 27. Moonbeam*                 | (operated only during "summer"  |
| (replacing Kaladar, June 1983)  | 28. Attawapiskat              | periods)                        |
|                                 | (removed February 1984)       |                                 |

\* indicates both a dry and wet deposition network site



PART III

SOUTHWESTERN REGION

CUMULATIVE PRECIPITATION CHEMISTRY LISTINGS

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : ALVINSTON/CUMULATIVE PRECIP.

#05

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | SAMPLING<br>START<br>HR. | END<br>HR. | SAMPLE<br>TYPE<br>01-RAIN<br>02-SNOW<br>03-COMP/04-OTHER | GAUGE<br>DEPTH(MM) | GAUGE<br>TYPE<br>00-APIOS<br>09-AES | SAMPLE<br>NUMBER | PROJECT<br>CODE<br>02-APIOS<br>03-SPECIAL | SUBPROJECT<br>CODE<br>01-MOE<br>03-AES | SAMPLER<br>EFFICI-<br>ENCY<br>(%) | COMMENTS<br>FIELD OFFICE |
|-----------------|------------------|--------------------------|------------|--|--------------------|-------------------------------------|------------------|---|--|-----------------------------------|--------------------------|
| JAN 31,84       | JAN 3,84         | 830                      | 830        | 2  | 32.0               | 0                                   | 19608            | 2   | 1                                      | 82                                |                          |
| FEB 28,84       | JAN 31,84        | 830                      | 830        | 3  | 56.6               | 9                                   | 19621            | 2   | 1                                      | 76                                | CD                       |
| MAR 27,84       | FEB 28,84        | 830                      | 800        | 1  | 94.0               | 0                                   | 19633            | 2   | 1                                      | 83                                | C                        |
| APR 24,84       | MAR 27,84        | 800                      | 830        | 1  | 71.6               | 9                                   | 19646            | 2   | 1                                      | 60                                | BCD                      |
| MAY 22,84       | APR 24,84        | 830                      | 1100       | 1  | 60.2               | 9                                   | 19657            | 2   | 1                                      | 43                                |                          |
| JUN 19,84       | MAY 22,84        | 1100                     | 830        | 1  | 120.0              | 0                                   | 19668            | 2   | 1                                      | U 57                              | ABDQJC                   |
| JUL 17,84       | JUN 19,84        | 830                      | 1410       | 1  | 87.0               | 0                                   | 19678            | 2   | 1                                      | 90                                | CD                       |
| AUG 14,84       | JUL 17,84        | 1410                     | 800        | 1  | 51.0               | 0                                   | 19688            | 2   | 1                                      | 81                                | HM                       |
| SEP 11,84       | AUG 14,84        | 830                      | 800        | 1  | 134.0              | 0                                   | 19704            | 2   | 1                                      | 97                                |                          |
| OCT 9,84        | SEP 11,84        | 800                      | 800        | 1  | 80.0               | 0                                   | 19703            | 2   | 1                                      | 73                                |                          |
| NOV 6,84        | OCT 9,84         | 830                      | 830        | 3  | 52.9               | 9                                   | 19714            | 2   | 1                                      | 81                                |                          |
| DEC 4,84        | NOV 6,84         | 830                      | 800        | 3  | 76.0               | 0                                   | 19735            | 2   | 1                                      | U 55                              | G                        |
| JAN 2,85        | DEC 4,84         | 800                      | 800        | 3  | 96.0               | 0                                   | 19748            | 2   | 1                                      | 96                                |                          |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | VOLUME<br>ML | CONDUCT.<br>UMHO/CM | PH<br>LAB | TOTAL H+<br>TO PH8.3<br>MG/L | SULPHATE<br>MG/L | NITRATE<br>AS N<br>MG/L | CALCIUM<br>MG/L |
|-----------------|------------------|--------------|---------------------|-----------|------------------------------|------------------|-------------------------|-----------------|
| JAN 31,84       | JAN 3,84         | 859.0        | 43.6                | 4.13      | 0.0986                       | 3.30             | 1.20                    | 0.62            |
| FEB 28,84       | JAN 31,84        | 1399.0       | 21.1                | G 5.05    | 0.0360                       | 3.75             | 0.58                    | 1.55            |
| MAR 27,84       | FEB 28,84        | 2553.0       | 25.5                | 4.65      | 0.0510                       | 3.50             | 0.54                    | 0.98            |
| APR 24,84       | MAR 27,84        | 1402.0       | 46.6                | 4.12      | 0.1112                       | 4.55             | 1.14                    | 0.93            |
| MAY 22,84       | APR 24,84        | 854.0        | 34.9                | U 7.11    | 0.0216                       | 6.75             | 1.03                    | U 2.36          |
| JUN 19,84       | MAY 22,84        | 2225.0       | U 80.0              | U 3.92    | 0.1616                       | U 11.75          | U 1.43                  | 2.00            |
| JUL 17,84       | JUN 19,84        | 2557.0       | 46.5                | 4.05      | 0.1036                       | 5.50             | 0.61                    | 0.44            |
| AUG 14,84       | JUL 17,84        | 1355.0       | U 100.0             | U 8.48    | U 0.0000                     | U 2.30           | U 0.02                  | U 18.00         |
| SEP 11,84       | AUG 14,84        | 4242.0       | 45.0                | 4.07      | 0.1182                       | 5.15             | 0.55                    | 0.27            |
| OCT 9,84        | SEP 11,84        | 1916.0       | 22.9                | 4.40      | 0.0622                       | 2.50             | 0.34                    | 0.26            |
| NOV 6,84        | OCT 9,84         | 1406.0       | 46.5                | 4.07      | 0.1146                       | 4.40             | 0.61                    | 0.22            |
| DEC 4,84        | NOV 6,84         | 1358.0       | 25.6                | 4.29      | 0.0712                       | 2.05             | 0.49                    | 0.18            |
| JAN 2,85        | DEC 4,84         | 3020.0       | 22.8                | 4.42      | *****                        | 1.90             | 0.37                    | 0.14            |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : ALVINSTON/CUMULATIVE PRECIP.

#05

PAGE : 2

| REMOVAL<br>DATE | EXPOSURE<br>DATE | CHLORIDE<br>MG/L | KJELDAHL<br>AS N<br>MG/L | MAGNESIM<br>MG/L | POTASSIM<br>MG/L | SODIUM<br>MG/L | AMMONIUM<br>AS N<br>MG/L | PHOSPHOR<br>MG/L |
|-----------------|------------------|------------------|--------------------------|------------------|------------------|----------------|--------------------------|------------------|
| JAN 31,84       | JAN 3,84         | 0.54             | 0.79                     | 0.120            | <T 0.015         | 0.225          | 0.670                    | 0.015            |
| FEB 28,84       | JAN 31,84        | 0.25             | 0.23                     | 0.270            | 0.115            | 0.135          | 0.068                    | 0.023            |
| MAR 27,84       | FEB 28,84        | 0.41             | 0.43                     | 0.185            | D 0.115          | 0.260          | 0.220                    | 0.017            |
| APR 24,84       | MAR 27,84        | 0.31             | 0.25                     | 0.170            | 0.065            | 0.095          | 0.540                    | 0.017            |
| MAY 22,84       | APR 24,84        | 0.33             | 1.82                     | 0.470            | 0.225            | 0.125          | 1.300                    | 0.069            |
| JUN 19,84       | MAY 22,84        | D 0.38           | U 1.55                   | U 0.400          | U 0.260          | 0.090          | 1.000                    | U 0.046          |
| JUL 17,84       | JUN 19,84        | 0.14             | 0.84                     | 0.070            | 0.045            | 0.030          | 0.760                    | 0.005            |
| AUG 14,84       | JUL 17,84        | U 4.80           | U 0.04                   | U *****          | U 1.500          | U *****        | U 0.005                  | U 0.012          |
| SEP 11,84       | AUG 14,84        | 0.20             | 0.63                     | 0.050            | D 0.045          | 0.020          | 0.595                    | 0.005            |
| OCT 9,84        | SEP 11,84        | 0.11             | 0.29                     | 0.035            | 0.040            | 0.040          | 0.255                    | <T 0.002         |
| NOV 6,84        | OCT 9,84         | 0.27             | 0.44                     | 0.040            | 0.060            | 0.085          | 0.375                    | <W 0.001         |
| DEC 4,84        | NOV 6,84         | 0.19             | 0.32                     | 0.025            | <T 0.005         | 0.080          | 0.260                    | 0.006            |
| JAN 2,85        | DEC 4,84         | 0.16             | 0.28                     | 0.020            | 0.030            | 0.075          | 0.215                    | 0.005            |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | MANGANSE<br>MG/L | NICKEL<br>MG/L | ZINC<br>MG/L | IRON<br>MG/L | LEAD<br>MG/L | VANADIUM<br>MG/L | ALUMINUM<br>MG/L |
|-----------------|------------------|------------------|----------------|--------------|--------------|--------------|------------------|------------------|
| JAN 31,84       | JAN 3,84         | 0.012            | 0.002          | 0.021        | 0.119        | 0.014        | < 0.002          | 0.086            |
| FEB 28,84       | JAN 31,84        | 0.013            | < 0.001        | 0.024        | 0.074        | 0.021        | < 0.002          | 0.080            |
| MAR 27,84       | FEB 28,84        | 0.008            | 0.003          | 0.034        | 0.092        | 0.007        | < 0.002          | 0.099            |
| APR 24,84       | MAR 27,84        | 0.006            | < 0.001        | 0.012        | 0.080        | 0.022        | < 0.002          | 0.061            |
| MAY 22,84       | APR 24,84        | U 0.023          | < 0.001        | 0.019        | U 0.523      | 0.015        | < 0.002          | U 0.559          |
| JUN 19,84       | MAY 22,84        | U 0.018          | < 0.001        | 0.011        | U 0.209      | U 0.012      | < 0.002          | U 0.248          |
| JUL 17,84       | JUN 19,84        | 0.003            | < 0.001        | 0.017        | 0.044        | 0.003        | < 0.002          | 0.036            |
| AUG 14,84       | JUL 17,84        | U 0.018          | U 0.001        | U 0.159      | U 0.044      | U 0.026      | U 0.002          | U 0.092          |
| SEP 11,84       | AUG 14,84        | 0.004            | < 0.001        | 0.008        | 0.025        | 0.007        | < 0.002          | 0.030            |
| OCT 9,84        | SEP 11,84        | 0.003            | < 0.001        | 0.004        | 0.016        | 0.006        | < 0.002          | 0.027            |
| NOV 6,84        | OCT 9,84         | 0.002            | 0.000          | 0.026        | 0.025        | 0.004        | 0.000            | 0.033            |
| DEC 4,84        | NOV 6,84         | 0.003            | 0.000          | 0.007        | 0.026        | 0.006        | 0.000            | 0.027            |
| JAN 2,85        | DEC 4,84         | 0.001            | 0.000          | 0.004        | 0.017        | 0.003        | < 0.000          | 0.013            |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

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STATION NAME : ALVINSTON/CUMULATIVE PRECIP.

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PAGE : 3

| REMOVAL<br>DATE | EXPOSURE<br>DATE | COPPER<br>MG/L | CADMIUM<br>MG/L | FREE H+<br>MG/L |
|-----------------|------------------|----------------|-----------------|-----------------|
| JAN 31,84       | JAN 3,84         | 0.002          | 0.0011          | 0.0741          |
| FEB 28,84       | JAN 31,84        | < 0.002        | 0.0007          | G 0.0089        |
| MAR 27,84       | FEB 28,84        | 0.002          | G 0.0028        | 0.0224          |
| APR 24,84       | MAR 27,84        | 0.002          | G 0.0022        | 0.0759          |
| MAY 22,84       | APR 24,84        | 0.005          | 0.0005          | U 0.0001        |
| JUN 19,84       | MAY 22,84        | 0.002          | 0.0002          | U 0.1202        |
| JUL 17,84       | JUN 19,84        | 0.001          | 0.0002          | 0.0891          |
| AUG 14,84       | JUL 17,84        | U 0.028        | U 0.0003        | U 0.0000        |
| SEP 11,84       | AUG 14,84        | < 0.001        | 0.0001          | 0.0851          |
| OCT 9,84        | SEP 11,84        | < 0.002        | 0.0001          | 0.0398          |
| NOV 6,84        | OCT 9,84         | 0.002          | 0.0004          | 0.0851          |
| DEC 4,84        | NOV 6,84         | 0.001          | 0.0007          | 0.0513          |
| JAN 2,85        | DEC 4,84         | 0.001          | 0.0002          | 0.0380          |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : COLCHESTER/CUMULATIVE PRECIP.

#01

PAGE : 1

| REMOVAL<br>DATE | EXPOSURE<br>DATE | SAMPLING<br>START<br>HR. | SAMPLING<br>END<br>HR. | SAMPLE<br>TYPE<br>01-RAIN<br>02-SNOW<br>03-COMP/04-OTHER | GAUGE<br>DEPTH(MM) | GAUGE<br>TYPE<br>00-APIOS<br>09-AES | SAMPLE<br>NUMBER | PROJECT<br>CODE<br>02-APIOS<br>03-SPECIAL | SUBPROJECT<br>CODE<br>01-MOE<br>03-AES | SAMPLER<br>EFFICI-<br>ENCY<br>(%) | COMMENTS<br>FIELD OFFICE |
|-----------------|------------------|--------------------------|------------------------|--|--------------------|-------------------------------------|------------------|---|--|-----------------------------------|--------------------------|
| JAN 31,84       | JAN 3,84         | 820                      | 805                    | 3  | 22.0               | 0                                   | 19601            | 2   | 1                                      | U 77                              | FJ                       |
| FEB 28,84       | JAN 31,84        | 805                      | 806                    | 3  | 25.0               | 0                                   | 19616            | 2   | 1                                      | U 78                              | FC                       |
| MAR 27,84       | FEB 28,84        | 816                      | 800                    | 3  | 87.0               | 0                                   | 19627            | 2   | 1                                      | U 66                              | G                        |
| APR 24,84       | MAR 27,84        | 800                      | 805                    | 1  | 69.0               | 0                                   | 19641            | 2   | 1                                      | 79                                | AC                       |
| MAY 22,84       | APR 24,84        | 805                      | 735                    | 1  | 72.0               | 0                                   | 19652            | 2   | 1                                      | 90                                | AC                       |
| JUN 19,84       | MAY 22,84        | 735                      | 755                    | 1  | 126.0              | 0                                   | 19663            | 2   | 1                                      | U 75                              | ACF                      |
| JUL 17,84       | JUN 19,84        | 810                      | 740                    | 1  | 31.0               | 0                                   | 19673            | 2   | 1                                      | 73                                | CD                       |
| AUG 14,84       | JUL 17,84        | 740                      | 800                    | 1  | 66.0               | 0                                   | 19683            | 2   | 1                                      | 74                                | B                        |
| SEP 11,84       | AUG 14,84        | 803                      | 758                    | 1  | 79.0               | 0                                   | 19706            | 2   | 1                                      | 86                                |                          |
| OCT 8,84        | SEP 11,84        | 812                      | 802                    | 1  | 51.0               | 0                                   | 19707            | 2   | 1                                      | 98                                |                          |
| NOV 6,84        | OCT 8,84         | 802                      | 1130                   | 3  | 59.0               | 0                                   | 19712            | 2   | 1                                      | 87                                | C                        |
| DEC 4,84        | NOV 6,84         | 1130                     | 800                    | 3  | 57.0               | 0                                   | 19730            | 2   | 1                                      | 83                                | C                        |
| JAN 1,85        | DEC 4,84         | 815                      | 430                    | 3  | 52.0               | 0                                   | 19746            | 2   | 1                                      | U 59                              | CG                       |

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | VOLUME<br>ML | CONDUCT.<br>UMHO/CM | PH<br>LAB | TOTAL H+<br>TO PH8.3<br>MG/L | SULPHATE<br>MG/L | NITRATE<br>AS N<br>MG/L | CALCIUM<br>MG/L |
|-----------------|------------------|--------------|---------------------|-----------|------------------------------|------------------|-------------------------|-----------------|
| JAN 31,84       | JAN 3,84         | 557.0        | 38.6                | 4.18      | 0.1010                       | 2.35             | 0.91                    | 0.40            |
| FEB 28,84       | JAN 31,84        | 640.0        | 30.2                | 4.48      | 0.0646                       | 4.05             | 0.90                    | 1.32            |
| MAR 27,84       | FEB 28,84        | 1887.0       | 30.1                | 4.30      | 0.0810                       | 2.90             | 0.49                    | 0.43            |
| APR 24,84       | MAR 27,84        | 1775.0       | 27.6                | U 6.79    | 0.0360                       | 5.20             | 0.91                    | 1.26            |
| MAY 22,84       | APR 24,84        | 2123.0       | 32.7                | 4.62      | D 0.0538                     | 5.55             | 0.74                    | 1.16            |
| JUN 19,84       | MAY 22,84        | 3099.0       | 36.7                | 4.20      | 0.0936                       | 4.30             | 0.48                    | 0.30            |
| JUL 17,84       | JUN 19,84        | 735.0        | 63.5                | 3.91      | 0.1412                       | 7.20             | 0.75                    | 0.60            |
| AUG 14,84       | JUL 17,84        | 1607.0       | 63.5                | 3.97      | 0.1388                       | 6.30             | 0.89                    | 0.68            |
| SEP 11,84       | AUG 14,84        | 2220.0       | 36.3                | 4.21      | 0.0902                       | 4.50             | 0.45                    | 0.29            |
| OCT 8,84        | SEP 11,84        | 1636.0       | 40.5                | 4.12      | 0.1026                       | 3.75             | 0.61                    | 0.27            |
| NOV 6,84        | OCT 8,84         | 1668.0       | 65.6                | 3.85      | 0.1600                       | 5.85             | 0.76                    | 0.18            |
| DEC 4,84        | NOV 6,84         | 1551.0       | 26.3                | 4.32      | 0.0706                       | 2.05             | 0.39                    | 0.15            |
| JAN 1,85        | DEC 4,84         | 1002.0       | 21.0                | 4.76      | *****                        | 2.75             | 0.38                    | 0.75            |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : COLCHESTER/CUMULATIVE PRECIP.

#01

PAGE : 2

| REMOVAL<br>DATE | EXPOSURE<br>DATE | CHLORIDE<br>MG/L | KJELDAHL<br>AS N<br>MG/L | MAGNESIM<br>MG/L | POTASSIM<br>MG/L | SODIUM<br>MG/L | AMMONIUM<br>AS N<br>MG/L | PHOSPHOR<br>MG/L |
|-----------------|------------------|------------------|--------------------------|------------------|------------------|----------------|--------------------------|------------------|
| JAN 31,84       | JAN 3,84         | 0.72             | 0.36                     | 0.085            | <T 0.005         | 0.475          | 0.210                    | 0.015            |
| FEB 28,84       | JAN 31,84        | 0.46             | 0.46                     | 0.340            | 0.020            | 0.240          | 0.410                    | 0.006            |
| MAR 27,84       | FEB 28,84        | 0.23             | 0.26                     | 0.105            | <T 0.010         | 0.110          | 0.184                    | 0.008            |
| APR 24,84       | MAR 27,84        | 0.57             | 0.83                     | 0.255            | B 0.240          | 0.175          | 1.600                    | 0.025            |
| MAY 22,84       | APR 24,84        | 0.26             | 1.11                     | 0.260            | 0.090            | 0.095          | 1.000                    | 0.025            |
| JUN 19,84       | MAY 22,84        | 0.19             | 0.63                     | 0.085            | 0.040            | 0.040          | 0.500                    | 0.006            |
| JUL 17,84       | JUN 19,84        | 0.34             | 1.00                     | 0.165            | 0.055            | 0.055          | 0.835                    | 0.012            |
| AUG 14,84       | JUL 17,84        | 0.24             | 0.67                     | 0.185            | 0.060            | 0.035          | 0.585                    | 0.030            |
| SEP 11,84       | AUG 14,84        | 0.16             | 0.54                     | 0.075            | 0.025            | 0.045          | 0.500                    | 0.010            |
| OCT 8,84        | SEP 11,84        | 0.26             | 0.42                     | 0.045            | 0.025            | 0.035          | 0.320                    | 0.016            |
| NOV 6,84        | OCT 8,84         | 0.32             | 0.47                     | 0.050            | 0.015            | 0.085          | 0.385                    | <T 0.001         |
| DEC 4,84        | NOV 6,84         | 0.22             | 0.25                     | 0.025            | <W 0.005         | 0.125          | 0.200                    | 0.005            |
| JAN 1,85        | DEC 4,84         | 0.72             | D 1.57                   | 0.085            | 0.200            | G 0.655        | 0.220                    | 0.019            |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | MANGANSE<br>MG/L | NICKEL<br>MG/L | ZINC<br>MG/L | IRON<br>MG/L | LEAD<br>MG/L | VANADIUM<br>MG/L | ALUMINUM<br>MG/L |
|-----------------|------------------|------------------|----------------|--------------|--------------|--------------|------------------|------------------|
| JAN 31,84       | JAN 3,84         | 0.002            | 0.006          | 0.016        | 0.034        | 0.013        | < 0.002          | 0.033            |
| FEB 28,84       | JAN 31,84        | 0.005            | < 0.001        | 0.043        | 0.064        | G 0.029      | < 0.002          | 0.062            |
| MAR 27,84       | FEB 28,84        | 0.004            | < 0.001        | 0.010        | 0.040        | D 0.024      | < 0.002          | 0.050            |
| APR 24,84       | MAR 27,84        | 0.014            | < 0.001        | D 0.037      | 0.202        | 0.019        | < 0.002          | 0.178            |
| MAY 22,84       | APR 24,84        | G 0.017          | < 0.001        | 0.016        | G 0.304      | 0.015        | < 0.002          | G 0.299          |
| JUN 19,84       | MAY 22,84        | 0.004            | < 0.001        | 0.006        | 0.056        | 0.005        | < 0.002          | 0.065            |
| JUL 17,84       | JUN 19,84        | 0.004            | < 0.001        | 0.011        | 0.051        | 0.007        | < 0.002          | 0.058            |
| AUG 14,84       | JUL 17,84        | 0.004            | < 0.001        | 0.010        | 0.050        | 0.012        | < 0.002          | 0.037            |
| SEP 11,84       | AUG 14,84        | 0.004            | < 0.001        | 0.011        | 0.027        | 0.007        | < 0.002          | 0.031            |
| OCT 8,84        | SEP 11,84        | 0.005            | < 0.001        | 0.012        | 0.028        | 0.009        | < 0.002          | 0.052            |
| NOV 6,84        | OCT 8,84         | 0.002            | 0.000          | 0.009        | 0.029        | 0.004        | 0.000            | 0.025            |
| DEC 4,84        | NOV 6,84         | 0.001            | < 0.000        | 0.006        | 0.013        | 0.005        | 0.000            | 0.022            |
| JAN 1,85        | DEC 4,84         | 0.004            | 0.002          | 0.051        | 0.061        | 0.015        | < 0.000          | 0.058            |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

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STATION NAME : COLCHESTER/CUMULATIVE PRECIP.

#01

PAGE : 3

| REMOVAL<br>DATE | EXPOSURE<br>DATE | COPPER<br>MG/L | CADMIUM<br>MG/L | FREE H+<br>MG/L |
|-----------------|------------------|----------------|-----------------|-----------------|
| JAN 31,84       | JAN 3,84         | 0.003          | 0.0002          | 0.0661          |
| FEB 28,84       | JAN 31,84        | 0.002          | 0.0002          | 0.0331          |
| MAR 27,84       | FEB 28,84        | 0.001          | < 0.0001        | 0.0501          |
| APR 24,84       | MAR 27,84        | 0.002          | 0.0003          | U 0.0002        |
| MAY 22,84       | APR 24,84        | 0.001          | 0.0001          | 0.0240          |
| JUN 19,84       | MAY 22,84        | 0.001          | 0.0001          | 0.0631          |
| JUL 17,84       | JUN 19,84        | < 0.002        | 0.0001          | 0.1230          |
| AUG 14,84       | JUL 17,84        | 0.003          | 0.0001          | 0.1072          |
| SEP 11,84       | AUG 14,84        | < 0.001        | 0.0001          | 0.0617          |
| OCT 8,84        | SEP 11,84        | < 0.002        | 0.0001          | 0.0759          |
| NOV 6,84        | OCT 8,84         | 0.001          | 0.0001          | 0.1413          |
| DEC 4,84        | NOV 6,84         | 0.000          | 0.0001          | 0.0479          |
| JAN 1,85        | DEC 4,84         | 0.007          | 0.0012          | 0.0174          |

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ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : HURON PARK/CUMULATIVE PRECIP.

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PAGE : 1

| REMOVAL<br>DATE | EXPOSURE<br>DATE | SAMPLING<br>START<br>HR. | SAMPLING<br>END<br>HR. | SAMPLE<br>TYPE<br>01-RAIN<br>02-SNOW<br>03-COMP/04-OTHER | GAUGE<br>DEPTH(MM) | GAUGE<br>TYPE<br>00-APIOS<br>09-AES | SAMPLE<br>NUMBER | PROJECT<br>CODE<br>02-APIOS<br>03-SPECIAL | SUBPROJECT<br>CODE<br>01-MOE<br>03-AES | SAMPLER<br>EFFICI-<br>ENCY<br>(%) | COMMENTS<br>FIELD OFFICE |
|-----------------|------------------|--------------------------|------------------------|--|--------------------|-------------------------------------|------------------|---|--|-----------------------------------|--------------------------|
| JAN 31,84       | JAN 3,84         | 900                      | 900                    | 3  | 24.0               | 0                                   | 19613            | 2   | 1                                      | 60                                |                          |
| FEB 28,84       | JAN 31,84        | 900                      | 1000                   | 3  | 36.0               | 0                                   | 19626            | 2   | 1                                      | 83                                | C                        |
| MAR 27,84       | FEB 28,84        | 1000                     | 1000                   | 3  | 73.0               | 0                                   | 19639            | 2   | 1                                      | 69                                | C HM                     |
| APR 25,84       | MAR 27,84        | 1000                     | 1000                   | 1  | 70.4               | 0                                   | 19651            | 2   | 1                                      | 61                                | CD                       |
| MAY 22,84       | APR 25,84        | 1000                     | 930                    | 1  | 69.7               | 0                                   | 19662            | 2   | 1                                      | U 10                              | ABCDG M                  |
| JUN 19,84       | MAY 22,84        | 930                      | 900                    | 1  | 175.8              | 0                                   | 19672            | 2   | 1                                      | 78                                | CD                       |
| JUL 17,84       | JUN 19,84        | 900                      | 1000                   | 1  | 45.9               | 0                                   | 19682            | 2   | 1                                      | 74                                | M                        |
| AUG 14,84       | JUL 17,84        | 1000                     | 1030                   | 1  | 39.6               | 0                                   | 19692            | 2   | 1                                      | U 14                              | G N                      |
| SEP 11,84       | AUG 14,84        | 1030                     | 930                    | 1  | 155.4              | 0                                   | 19693            | 2   | 1                                      | U 1                               | CG                       |
| OCT 9,84        | SEP 11,84        | 1000                     | 900                    | 1  | 63.8               | 0                                   | 19694            | 2   | 1                                      | 60                                | AC                       |
| NOV 6,84        | OCT 9,84         | 1000                     | 900                    | 3  | 60.2               | 0                                   | 19719            | 2   | 1                                      | 77                                |                          |
| DEC 4,84        | NOV 6,84         | 1000                     | 1000                   | 3  | 82.1               | 0                                   | 19733            | 2   | 1                                      | 79                                |                          |
| JAN 2,85        | DEC 4,84         | 1000                     | 1100                   | 2  | 84.0               | 0                                   | 19751            | 2   | 1                                      | 48                                | N                        |

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | VOLUME<br>ML | CONDUCT.<br>UMHO/CM | PH<br>LAB | TOTAL H+<br>TO PH8.3<br>MG/L | SULPHATE<br>MG/L | NITRATE<br>AS N<br>MG/L | CALCIUM<br>MG/L |
|-----------------|------------------|--------------|---------------------|-----------|------------------------------|------------------|-------------------------|-----------------|
| JAN 31,84       | JAN 3,84         | 473.0        | 50.5                | 4.26      | 0.1000                       | 4.40             | G 1.95                  | 1.27            |
| FEB 28,84       | JAN 31,84        | 979.0        | 29.4                | 4.61      | 0.0570                       | 4.25             | 0.95                    | 1.26            |
| MAR 27,84       | FEB 28,84        | 1648.0       | 31.8                | U 6.83    | 0.0172                       | 5.10             | 0.71                    | U 3.90          |
| APR 25,84       | MAR 27,84        | 1400.0       | 52.0                | 4.09      | 0.1158                       | 5.40             | 1.05                    | 0.68            |
| MAY 22,84       | APR 25,84        | 230.0        | D 61.2              | U 7.66    | 0.0242                       | 6.85             | 0.97                    | U 6.50          |
| JUN 19,84       | MAY 22,84        | 4480.0       | 20.9                | G 4.85    | 0.0386                       | 3.75             | 0.48                    | 1.09            |
| JUL 17,84       | JUN 19,84        | 1111.0       | 41.4                | U 7.20    | 0.0372                       | 5.50             | 0.56                    | 2.17            |
| AUG 14,84       | JUL 17,84        | 183.0        | U 74.5              | U 7.35    | U 0.0370                     | U 11.10          | U 0.16                  | U 2.00          |
| SEP 11,84       | AUG 14,84        | 73.0         | *****               | U 6.87    | *****                        | *****            | *****                   | *****           |
| OCT 9,84        | SEP 11,84        | 1254.0       | 35.5                | 4.26      | 0.0824                       | 3.75             | 0.52                    | 0.35            |
| NOV 6,84        | OCT 9,84         | 1519.0       | 40.9                | 4.17      | 0.0990                       | 3.90             | 0.61                    | 0.29            |
| DEC 4,84        | NOV 6,84         | 2123.0       | 30.0                | 4.30      | 0.0744                       | 2.55             | 0.57                    | 0.25            |
| JAN 2,85        | DEC 4,84         | 1334.0       | 18.6                | 4.68      | *****                        | 2.10             | 0.41                    | 0.49            |



ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : HURON PARK/CUMULATIVE PRECIP.

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PAGE : 2

| REMOVAL<br>DATE | EXPOSURE<br>DATE | CHLORIDE<br>MG/L | KJELDAHL<br>AS N<br>MG/L | MAGNESIM<br>MG/L | POTASSIM<br>MG/L | SODIUM<br>MG/L | AMMONIUM<br>AS N<br>MG/L | PHOSPHOR<br>MG/L |
|-----------------|------------------|------------------|--------------------------|------------------|------------------|----------------|--------------------------|------------------|
| JAN 31,84       | JAN 3,84         | U 1.24           | 1.31                     | 0.240            | 0.025            | U 0.820        | 1.080                    | 0.020            |
| FEB 28,84       | JAN 31,84        | 0.38             | 0.75                     | 0.220            | 0.020            | 0.235          | 0.700                    | 0.023            |
| MAR 27,84       | FEB 28,84        | 0.27             | 0.30                     | U 0.775          | 0.040            | 0.130          | 0.106                    | 0.026            |
| APR 25,84       | MAR 27,84        | 0.21             | 0.35                     | 0.110            | 0.040            | 0.045          | 0.920                    | 0.012            |
| MAY 22,84       | APR 25,84        | 0.47             | U 2.60                   | U 1.680          | U 0.295          | 0.195          | U 2.500                  | U 0.360          |
| JUN 19,84       | MAY 22,84        | 0.11             | 0.58                     | 0.215            | 0.030            | 0.025          | 0.455                    | 0.009            |
| JUL 17,84       | JUN 19,84        | 0.19             | U 4.50                   | 0.260            | U 0.525          | D 0.220        | U 2.650                  | U 0.535          |
| AUG 14,84       | JUL 17,84        | U 4.80           | U *****                  | U 0.490          | U 1.000          | U 1.000        | U 2.900                  | U *****          |
| SEP 11,84       | AUG 14,84        | *****            | *****                    | *****            | *****            | *****          | *****                    | *****            |
| OCT 9,84        | SEP 11,84        | 0.13             | 0.55                     | 0.050            | 0.045            | 0.055          | 0.545                    | <T 0.004         |
| NOV 6,84        | OCT 9,84         | 0.20             | 0.50                     | 0.040            | 0.020            | 0.050          | 0.480                    | <W 0.001         |
| DEC 4,84        | NOV 6,84         | 0.19             | 0.51                     | 0.035            | <T 0.005         | 0.065          | 0.460                    | 0.006            |
| JAN 2,85        | DEC 4,84         | 0.16             | 0.38                     | 0.075            | <T 0.015         | 0.075          | 0.320                    | 0.007            |

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | MANGANSE<br>MG/L | NICKEL<br>MG/L | ZINC<br>MG/L | IRON<br>MG/L | LEAD<br>MG/L | VANADIUM<br>MG/L | ALUMINUM<br>MG/L |
|-----------------|------------------|------------------|----------------|--------------|--------------|--------------|------------------|------------------|
| JAN 31,84       | JAN 3,84         | 0.007            | 0.005          | 0.038        | 0.103        | U 0.050      | < 0.002          | 0.106            |
| FEB 28,84       | JAN 31,84        | 0.005            | 0.001          | 0.019        | 0.053        | 0.019        | < 0.002          | 0.034            |
| MAR 27,84       | FEB 28,84        | 0.001            | < 0.001        | 0.003        | 0.192        | 0.005        | < 0.002          | G 0.331          |
| APR 25,84       | MAR 27,84        | 0.004            | < 0.001        | 0.009        | 0.050        | 0.012        | < 0.002          | 0.042            |
| MAY 22,84       | APR 25,84        | *****            | *****          | *****        | *****        | *****        | *****            | *****            |
| JUN 19,84       | MAY 22,84        | 0.006            | < 0.001        | 0.006        | 0.083        | 0.004        | < 0.002          | 0.099            |
| JUL 17,84       | JUN 19,84        | 0.010            | < 0.001        | B 0.061      | 0.133        | 0.003        | < 0.002          | 0.106            |
| AUG 14,84       | JUL 17,84        | U *****          | U *****        | U *****      | U *****      | U *****      | U *****          | U *****          |
| SEP 11,84       | AUG 14,84        | *****            | *****          | *****        | *****        | *****        | *****            | *****            |
| OCT 9,84        | SEP 11,84        | 0.003            | < 0.001        | 0.006        | 0.039        | 0.005        | < 0.002          | 0.063            |
| NOV 6,84        | OCT 9,84         | 0.003            | < 0.000        | 0.008        | 0.022        | 0.007        | 0.000            | 0.032            |
| DEC 4,84        | NOV 6,84         | 0.002            | < 0.000        | 0.006        | 0.013        | 0.005        | 0.000            | 0.017            |
| JAN 2,85        | DEC 4,84         | 0.003            | 0.002          | 0.006        | 0.042        | 0.005        | < 0.000          | 0.042            |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

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STATION NAME : HURON PARK/CUMULATIVE PRECIP.

#06

PAGE : 3

| REMOVAL<br>DATE | EXPOSURE<br>DATE | COPPER<br>MG/L | CADMIUM<br>MG/L | FREE H+<br>MG/L |
|-----------------|------------------|----------------|-----------------|-----------------|
| JAN 31,84       | JAN 3,84         | 0.005          | 0.0003          | 0.0550          |
| FEB 28,84       | JAN 31,84        | 0.003          | 0.0001          | 0.0245          |
| MAR 27,84       | FEB 28,84        | < 0.002        | < 0.0001        | U 0.0001        |
| APR 25,84       | MAR 27,84        | 0.002          | < 0.0001        | 0.0813          |
| MAY 22,84       | APR 25,84        | *****          | *****           | U 0.0000        |
| JUN 19,84       | MAY 22,84        | 0.001          | 0.0001          | G 0.0141        |
| JUL 17,84       | JUN 19,84        | 0.001          | 0.0004          | U 0.0001        |
| AUG 14,84       | JUL 17,84        | U *****        | U *****         | U 0.0000        |
| SEP 11,84       | AUG 14,84        | *****          | *****           | U 0.0001        |
| OCT 9,84        | SEP 11,84        | < 0.002        | 0.0001          | 0.0550          |
| NOV 6,84        | OCT 9,84         | 0.000          | 0.0001          | 0.0676          |
| DEC 4,84        | NOV 6,84         | 0.001          | 0.0002          | 0.0501          |
| JAN 2,85        | DEC 4,84         | 0.000          | 0.0001          | 0.0209          |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : MERLIN/CUMULATIVE PRECIP.

#02

PAGE : 1

| REMOVAL<br>DATE | EXPOSURE<br>DATE | SAMPLING<br>START<br>HR. | END<br>HR. | SAMPLE<br>TYPE<br>01-RAIN<br>02-SNOW<br>03-COMP/04-OTHER | GAUGE<br>DEPTH(MM) | GAUGE<br>TYPE<br>00-APIOS<br>09-AES | SAMPLE<br>NUMBER | PROJECT<br>CODE<br>02-APIOS<br>03-SPECIAL | SUBPROJECT<br>CODE<br>01-MOE<br>03-AES | SAMPLER<br>EFFICI-<br>ENCY<br>(%) | COMMENTS<br>FIELD OFFICE |
|-----------------|------------------|--------------------------|------------|--|--------------------|-------------------------------------|------------------|---|--|-----------------------------------|--------------------------|
| JAN 31,84       | JAN 3,84         | 700                      | 700        | 2  | 16.0               | 0                                   | 19602            | 2   | 1                                      | 78                                |                          |
| FEB 28,84       | JAN 31,84        | 700                      | 800        | 3  | 54.0               | 0                                   | 19617            | 2   | 1                                      | 70                                | CD                       |
| MAR 27,84       | FEB 28,84        | 800                      | 700        | 3  | 62.0               | 0                                   | 19628            | 2   | 1                                      | 95                                | C                        |
| APR 24,84       | MAR 27,84        | 800                      | 700        | 1  | 60.0               | 0                                   | 19642            | 2   | 1                                      | U 43                              | JCD                      |
| MAY 22,84       | APR 24,84        | 700                      | 700        | 1  | 50.0               | 0                                   | 19653            | 2   | 1                                      | 82                                | ACD H                    |
| JUN 19,84       | MAY 22,84        | 700                      | 700        | 1  | 120.0              | 0                                   | 19664            | 2   | 1                                      | 70                                | CD                       |
| JUL 17,84       | JUN 19,84        | 700                      | 700        | 1  | 45.0               | 0                                   | 19674            | 2   | 1                                      | 65                                | CD                       |
| AUG 14,84       | JUL 17,84        | 700                      | 700        | 1  | 45.0               | 0                                   | 19684            | 2   | 1                                      | 91                                | D                        |
| SEP 11,84       | AUG 14,84        | 700                      | 700        | 1  | 74.0               | 0                                   | 19708            | 2   | 1                                      | 91                                |                          |
| OCT 9,84        | SEP 11,84        | 700                      | 730        | 1  | 56.0               | 0                                   | 19709            | 2   | 1                                      | 81                                |                          |
| NOV 6,84        | OCT 9,84         | 730                      | 730        | 3  | 52.0               | 0                                   | 19713            | 2   | 1                                      | 87                                | A                        |
| DEC 4,84        | NOV 6,84         | 730                      | 730        | 3  | 88.0               | 0                                   | 19744            | 2   | 1                                      | 53                                |                          |
| JAN 2,85        | DEC 4,84         | 730                      | 900        | 3  | 84.2               | 9                                   | 19745            | 2   | 1                                      | 108                               |                          |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | VOLUME<br>ML | CONDUCT.<br>UMHO/CM | PH<br>LAB | TOTAL H+<br>TO PH8.3<br>MG/L | SULPHATE<br>MG/L | NITRATE<br>AS N<br>MG/L | CALCIUM<br>MG/L |
|-----------------|------------------|--------------|---------------------|-----------|------------------------------|------------------|-------------------------|-----------------|
| JAN 31,84       | JAN 3,84         | 408.0        | 38.8                | 4.28      | 0.0892                       | 3.05             | 1.15                    | 1.13            |
| FEB 28,84       | JAN 31,84        | 1238.0       | 24.7                | 4.42      | 0.0646                       | 2.75             | 0.46                    | 0.57            |
| MAR 27,84       | FEB 28,84        | 1917.0       | 30.3                | 4.68      | 0.0518                       | 4.75             | 0.78                    | 1.60            |
| APR 24,84       | MAR 27,84        | 855.0        | 46.5                | 4.24      | 0.0884                       | 5.50             | 1.31                    | 1.84            |
| MAY 22,84       | APR 24,84        | 1345.0       | 40.4                | U 5.84    | 0.0252                       | 7.45             | 1.20                    | U 3.95          |
| JUN 19,84       | MAY 22,84        | 2730.0       | 32.8                | 4.50      | 0.0588                       | 5.45             | 0.66                    | 1.13            |
| JUL 17,84       | JUN 19,84        | 958.0        | 44.5                | 4.22      | 0.0842                       | 6.30             | 0.82                    | 1.06            |
| AUG 14,84       | JUL 17,84        | 1340.0       | 70.9                | 3.95      | 0.1480                       | 7.20             | 1.07                    | 0.58            |
| SEP 11,84       | AUG 14,84        | 2194.0       | 50.4                | 4.05      | 0.1190                       | 5.70             | 0.63                    | 0.28            |
| OCT 9,84        | SEP 11,84        | 1488.0       | 41.7                | 4.11      | 0.1032                       | 3.95             | 0.63                    | 0.23            |
| NOV 6,84        | OCT 9,84         | 1470.0       | 49.0                | 4.01      | 0.1222                       | 4.60             | 0.60                    | 0.18            |
| DEC 4,84        | NOV 6,84         | 1535.0       | 32.8                | 4.21      | *****                        | 2.70             | 0.52                    | 0.23            |
| JAN 2,85        | DEC 4,84         | 2953.0       | 22.5                | 4.54      | *****                        | 2.40             | 0.36                    | 0.46            |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : MERLIN/CUMULATIVE PRECIP.

#02

PAGE : 2

| REMOVAL<br>DATE | EXPOSURE<br>DATE | CHLORIDE<br>MG/L | KJELDAHL<br>AS N<br>MG/L | MAGNESIM<br>MG/L | POTASSIM<br>MG/L | SODIUM<br>MG/L | AMMONIUM<br>AS N<br>MG/L | PHOSPHOR<br>MG/L |
|-----------------|------------------|------------------|--------------------------|------------------|------------------|----------------|--------------------------|------------------|
| JAN 31,84       | JAN 3,84         | U 1.22           | 0.50                     | 0.205            | 0.050            | U 0.905        | 0.212                    | 0.019            |
| FEB 28,84       | JAN 31,84        | 0.27             | 0.20                     | 0.095            | <T 0.005         | 0.195          | 0.160                    | 0.009            |
| MAR 27,84       | FEB 28,84        | 0.42             | 0.43                     | 0.370            | 0.020            | 0.235          | 0.296                    | 0.013            |
| APR 24,84       | MAR 27,84        | 0.45             | 1.13                     | 0.310            | 0.060            | 0.165          | 0.535                    | 0.078            |
| MAY 22,84       | APR 24,84        | 0.44             | 0.75                     | U 0.800          | 0.185            | 0.155          | 0.370                    | 0.073            |
| JUN 19,84       | MAY 22,84        | 0.22             | 0.90                     | 0.240            | 0.050            | 0.070          | 0.805                    | <T 0.004         |
| JUL 17,84       | JUN 19,84        | 0.17             | 1.11                     | 0.215            | 0.050            | <T 0.010       | 1.000                    | 0.013            |
| AUG 14,84       | JUL 17,84        | 0.19             | 1.02                     | 0.110            | 0.065            | 0.030          | 1.050                    | 0.028            |
| SEP 11,84       | AUG 14,84        | 0.20             | 0.78                     | 0.050            | 0.030            | 0.045          | 0.695                    | 0.006            |
| OCT 9,84        | SEP 11,84        | 0.22             | 0.49                     | 0.030            | 0.030            | 0.040          | 0.435                    | 0.006            |
| NOV 6,84        | OCT 9,84         | 0.26             | 0.44                     | 0.030            | 0.050            | 0.090          | 0.375                    | <T 0.005         |
| DEC 4,84        | NOV 6,84         | 0.24             | 0.33                     | 0.020            | <T 0.020         | 0.125          | 0.260                    | 0.006            |
| JAN 2,85        | DEC 4,84         | 0.43             | 0.85                     | 0.040            | 0.095            | 0.365          | 0.220                    | 0.014            |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | MANGANSE<br>MG/L | NICKEL<br>MG/L | ZINC<br>MG/L | IRON<br>MG/L | LEAD<br>MG/L | VANADIUM<br>MG/L | ALUMINUM<br>MG/L |
|-----------------|------------------|------------------|----------------|--------------|--------------|--------------|------------------|------------------|
| JAN 31,84       | JAN 3,84         | 0.003            | < 0.001        | 0.026        | 0.067        | 0.015        | < 0.002          | 0.069            |
| FEB 28,84       | JAN 31,84        | 0.002            | < 0.001        | 0.010        | 0.034        | 0.013        | < 0.002          | 0.032            |
| MAR 27,84       | FEB 28,84        | 0.008            | < 0.001        | 0.011        | 0.150        | 0.010        | < 0.002          | 0.147            |
| APR 24,84       | MAR 27,84        | 0.011            | < 0.001        | 0.014        | 0.256        | 0.019        | < 0.002          | 0.231            |
| MAY 22,84       | APR 24,84        | U 0.029          | < 0.001        | 0.021        | U 0.665      | 0.020        | < 0.002          | U 0.688          |
| JUN 19,84       | MAY 22,84        | 0.006            | < 0.001        | 0.007        | 0.091        | 0.007        | < 0.002          | 0.092            |
| JUL 17,84       | JUN 19,84        | 0.005            | < 0.001        | 0.009        | 0.083        | 0.008        | < 0.002          | 0.091            |
| AUG 14,84       | JUL 17,84        | < 0.001          | < 0.001        | 0.008        | 0.042        | 0.016        | < 0.002          | 0.036            |
| SEP 11,84       | AUG 14,84        | 0.004            | < 0.001        | 0.008        | 0.038        | 0.007        | < 0.002          | 0.054            |
| OCT 9,84        | SEP 11,84        | 0.003            | < 0.001        | 0.009        | 0.031        | 0.005        | < 0.002          | 0.035            |
| NOV 6,84        | OCT 9,84         | 0.002            | 0.000          | 0.020        | 0.032        | 0.005        | < 0.000          | 0.034            |
| DEC 4,84        | NOV 6,84         | 0.002            | 0.000          | 0.005        | 0.024        | 0.008        | < 0.000          | 0.026            |
| JAN 2,85        | DEC 4,84         | 0.003            | 0.001          | 0.027        | 0.050        | 0.010        | < 0.000          | 0.044            |

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ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

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STATION NAME : MERLIN/CUMULATIVE PRECIP.

#02

PAGE : 3

| REMOVAL<br>DATE | EXPOSURE<br>DATE | COPPER<br>MG/L | CADMIUM<br>MG/L | FREE H+<br>MG/L |
|-----------------|------------------|----------------|-----------------|-----------------|
| JAN 31,84       | JAN 3,84         | < 0.003        | 0.0008          | 0.0525          |
| FEB 28,84       | JAN 31,84        | < 0.002        | 0.0001          | 0.0380          |
| MAR 27,84       | FEB 28,84        | < 0.002        | 0.0001          | 0.0209          |
| APR 24,84       | MAR 27,84        | 0.002          | < 0.0001        | 0.0575          |
| MAY 22,84       | APR 24,84        | 0.002          | 0.0001          | U 0.0014        |
| JUN 19,84       | MAY 22,84        | 0.003          | 0.0001          | 0.0316          |
| JUL 17,84       | JUN 19,84        | 0.002          | 0.0001          | 0.0603          |
| AUG 14,84       | JUL 17,84        | 0.002          | 0.0001          | 0.1122          |
| SEP 11,84       | AUG 14,84        | < 0.001        | 0.0001          | 0.0891          |
| OCT 9,84        | SEP 11,84        | < 0.002        | 0.0001          | 0.0776          |
| NOV 6,84        | OCT 9,84         | 0.001          | 0.0001          | 0.0977          |
| DEC 4,84        | NOV 6,84         | 0.001          | 0.0001          | 0.0617          |
| JAN 2,85        | DEC 4,84         | 0.003          | 0.0007          | 0.0288          |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : PALMERSTON/CUMULATIVE PRECIP.

#08

PAGE : 1

| REMOVAL<br>DATE | EXPOSURE<br>DATE | SAMPLING<br>START<br>HR. | SAMPLING<br>END<br>HR. | SAMPLE<br>TYPE<br>01-RAIN<br>02-SNOW<br>03-COMP/04-OTHER | GAUGE<br>DEPTH(MM) | GAUGE<br>TYPE<br>00-APIOS<br>09-AES | SAMPLE<br>NUMBER | PROJECT<br>CODE<br>02-APIOS<br>03-SPECIAL | SUBPROJECT<br>CODE<br>01-MOE<br>03-AES | SAMPLER<br>EFFICI-<br>ENCY<br>(%) | COMMENTS<br>FIELD OFFICE |
|-----------------|------------------|--------------------------|------------------------|--|--------------------|-------------------------------------|------------------|---|--|-----------------------------------|--------------------------|
| JAN 31,84       | JAN 4,84         | 1300                     | 1300                   | 2  | 45.2               | 9                                   | 19610            | 2   | 1                                      | 23                                |                          |
| FEB 28,84       | JAN 31,84        | 1300                     | 1300                   | 3  | 55.0               | 0                                   | 19623            | 2   | 1                                      | U 0                               | GE                       |
| MAR 27,84       | FEB 28,84        | 1300                     | 1300                   | 3  | 72.6               | 9                                   | 19635            | 2   | 1                                      | 46                                | C                        |
| APR 24,84       | MAR 27,84        | 1300                     | 1300                   | 1  | 52.7               | 9                                   | 19648            | 2   | 1                                      | 27                                |                          |
| MAY 22,84       | APR 24,84        | 1300                     | 1200                   | 1  | 27.0               | 0                                   | 19659            | 2   | 1                                      | 80                                | CD                       |
| JUN 19,84       | MAY 22,84        | 1200                     | 1300                   | 1  | 150.0              | 0                                   | 19670            | 2   | 1                                      | 70                                | ACD                      |
| JUL 17,84       | JUN 19,84        | 1300                     | 1300                   | 1  | 72.0               | 0                                   | 19680            | 2   | 1                                      | 67                                |                          |
| AUG 14,84       | JUL 17,84        | 1300                     | 1300                   | 1  | 18.8               | 9                                   | 19690            | 2   | 1                                      | 41                                |                          |
| SEP 11,84       | AUG 14,84        | 1300                     | 1300                   | 1  | 110.0              | 0                                   | 19696            | 2   | 1                                      | 80                                |                          |
| OCT 9,84        | SEP 11,84        | 1300                     | 1300                   | 1  | 40.0               | 0                                   | 19710            | 2   | 1                                      | 88                                |                          |
| NOV 6,84        | OCT 9,84         | 1300                     | 1300                   | 3  | 75.0               | 0                                   | 19718            | 2   | 1                                      | 84                                |                          |
| DEC 3,84        | NOV 6,84         | 1300                     | 1300                   | 3  | 83.0               | 0                                   | 19749            | 2   | 1                                      | 73                                |                          |
| DEC 31,84       | DEC 3,84         | 1300                     | 1300                   | 3  | 88.0               | 0                                   | 19750            | 2   | 1                                      | 79                                |                          |

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | VOLUME<br>ML | CONDUCT.<br>UMHO/CM | PH<br>LAB | TOTAL H+<br>TO PH8.3<br>MG/L | SULPHATE<br>MG/L | NITRATE<br>AS N<br>MG/L | CALCIUM<br>MG/L |
|-----------------|------------------|--------------|---------------------|-----------|------------------------------|------------------|-------------------------|-----------------|
| JAN 31,84       | JAN 4,84         | 347.0        | 40.7                | 4.22      | 0.0996                       | 2.75             | 1.13                    | 0.38            |
| FEB 28,84       | JAN 31,84        | 0.0          | *****               | *****     | *****                        | *****            | *****                   | *****           |
| MAR 27,84       | FEB 28,84        | 1098.0       | 22.1                | U 6.31    | 0.0222                       | 4.20             | 0.65                    | 1.55            |
| APR 24,84       | MAR 27,84        | 474.0        | 23.0                | 4.71      | 0.0502                       | 2.95             | 0.69                    | 0.71            |
| MAY 22,84       | APR 24,84        | 710.0        | 39.5                | U 7.32    | 0.0218                       | 7.20             | 1.15                    | U 2.80          |
| JUN 19,84       | MAY 22,84        | 3412.0       | 22.0                | 4.44      | 0.0602                       | 2.90             | 0.35                    | 0.28            |
| JUL 17,84       | JUN 19,84        | 1581.0       | 52.0                | 4.05      | 0.1102                       | 6.50             | 0.80                    | 0.67            |
| AUG 14,84       | JUL 17,84        | 251.0        | 59.5                | 4.18      | 0.1064                       | 8.90             | 1.04                    | 1.80            |
| SEP 11,84       | AUG 14,84        | 2886.0       | 38.0                | 4.19      | 0.0884                       | 4.20             | 0.52                    | 0.28            |
| OCT 9,84        | SEP 11,84        | 1144.0       | 38.7                | 4.25      | 0.0896                       | 4.55             | 0.60                    | 0.29            |
| NOV 6,84        | OCT 9,84         | 2054.0       | 36.5                | 4.20      | 0.0932                       | 3.55             | 0.46                    | 0.19            |
| DEC 3,84        | NOV 6,84         | 1970.0       | 26.4                | 4.38      | *****                        | 2.40             | 0.51                    | 0.13            |
| DEC 31,84       | DEC 3,84         | 2283.0       | 19.4                | 4.55      | *****                        | 1.95             | 0.33                    | 0.14            |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : PALMERSTON/CUMULATIVE PRECIP.

#08

PAGE : 2

| REMOVAL<br>DATE | EXPOSURE<br>DATE | CHLORIDE<br>MG/L | KJELDAHL<br>AS N<br>MG/L | MAGNESIM<br>MG/L | POTASSIM<br>MG/L | SODIUM<br>MG/L | AMMONIUM<br>AS N<br>MG/L | PHOSPHOR<br>MG/L |
|-----------------|------------------|------------------|--------------------------|------------------|------------------|----------------|--------------------------|------------------|
| JAN 31,84       | JAN 4,84         | 0.49             | 0.89                     | 0.090            | <W 0.005         | 0.325          | *****                    | 0.018            |
| FEB 28,84       | JAN 31,84        | *****            | *****                    | *****            | *****            | *****          | *****                    | *****            |
| MAR 27,84       | FEB 28,84        | 0.28             | 0.55                     | 0.490            | 0.050            | 0.155          | 0.294                    | D 0.056          |
| APR 24,84       | MAR 27,84        | 0.25             | 0.57                     | 0.210            | 0.030            | 0.085          | 0.595                    | 0.043            |
| MAY 22,84       | APR 24,84        | 0.38             | 1.90                     | U 0.850          | 0.120            | 0.140          | 1.450                    | 0.052            |
| JUN 19,84       | MAY 22,84        | 0.10             | 0.54                     | 0.065            | 0.030            | 0.030          | 0.390                    | 0.008            |
| JUL 17,84       | JUN 19,84        | 0.17             | 1.09                     | 0.205            | 0.040            | <T 0.010       | 0.950                    | 0.005            |
| AUG 14,84       | JUL 17,84        | 0.24             | *****                    | 0.420            | 0.140            | 0.085          | 1.000                    | *****            |
| SEP 11,84       | AUG 14,84        | 0.10             | 0.59                     | 0.060            | 0.030            | 0.020          | 0.575                    | <T 0.004         |
| OCT 9,84        | SEP 11,84        | 0.14             | 0.86                     | 0.065            | 0.025            | 0.025          | 0.790                    | 0.005            |
| NOV 6,84        | OCT 9,84         | 0.18             | 0.42                     | 0.040            | 0.030            | 0.045          | 0.400                    | <W 0.001         |
| DEC 3,84        | NOV 6,84         | 0.15             | 0.56                     | 0.030            | 0.040            | 0.055          | 0.495                    | 0.008            |
| DEC 31,84       | DEC 3,84         | 0.14             | 0.40                     | 0.035            | <T 0.015         | 0.075          | 0.340                    | 0.006            |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | MANGANSE<br>MG/L | NICKEL<br>MG/L | ZINC<br>MG/L | IRON<br>MG/L | LEAD<br>MG/L | VANADIUM<br>MG/L | ALUMINUM<br>MG/L |
|-----------------|------------------|------------------|----------------|--------------|--------------|--------------|------------------|------------------|
| JAN 31,84       | JAN 4,84         | 0.003            | < 0.001        | 0.033        | 0.057        | 0.016        | < 0.002          | 0.085            |
| FEB 28,84       | JAN 31,84        | *****            | *****          | *****        | *****        | *****        | *****            | *****            |
| MAR 27,84       | FEB 28,84        | U 0.024          | < 0.001        | 0.009        | 0.259        | 0.005        | < 0.002          | G 0.288          |
| APR 24,84       | MAR 27,84        | *****            | *****          | *****        | *****        | *****        | *****            | *****            |
| MAY 22,84       | APR 24,84        | U 0.030          | < 0.001        | 0.022        | U 0.790      | G 0.022      | < 0.002          | U 0.762          |
| JUN 19,84       | MAY 22,84        | 0.005            | < 0.001        | 0.002        | 0.056        | 0.004        | < 0.002          | 0.054            |
| JUL 17,84       | JUN 19,84        | 0.004            | < 0.001        | 0.009        | 0.038        | 0.004        | < 0.002          | 0.044            |
| AUG 14,84       | JUL 17,84        | 0.009            | < 0.001        | 0.020        | 0.086        | G 0.032      | < 0.002          | 0.080            |
| SEP 11,84       | AUG 14,84        | 0.003            | < 0.001        | 0.004        | 0.040        | 0.005        | < 0.002          | 0.039            |
| OCT 9,84        | SEP 11,84        | 0.002            | < 0.001        | 0.005        | 0.020        | 0.012        | < 0.002          | 0.034            |
| NOV 6,84        | OCT 9,84         | 0.002            | 0.001          | 0.006        | 0.020        | 0.005        | < 0.000          | 0.019            |
| DEC 3,84        | NOV 6,84         | 0.002            | < 0.000        | 0.005        | 0.013        | 0.006        | < 0.000          | 0.019            |
| DEC 31,84       | DEC 3,84         | 0.002            | < 0.000        | 0.004        | 0.033        | 0.006        | < 0.000          | 0.038            |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

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STATION NAME : PALMERSTON/CUMULATIVE PRECIP.

#08

PAGE : 3

| REMOVAL<br>DATE | EXPOSURE<br>DATE | COPPER<br>MG/L | CADMIUM<br>MG/L | FREE H+<br>MG/L |
|-----------------|------------------|----------------|-----------------|-----------------|
| JAN 31,84       | JAN 4,84         | 0.003          | 0.0002          | 0.0603          |
| FEB 28,84       | JAN 31,84        | *****          | *****           | *****           |
| MAR 27,84       | FEB 28,84        | < 0.002        | 0.0001          | U 0.0005        |
| APR 24,84       | MAR 27,84        | *****          | *****           | 0.0195          |
| MAY 22,84       | APR 24,84        | 0.004          | 0.0002          | U 0.0000        |
| JUN 19,84       | MAY 22,84        | 0.001          | 0.0001          | 0.0363          |
| JUL 17,84       | JUN 19,84        | < 0.002        | 0.0001          | 0.0891          |
| AUG 14,84       | JUL 17,84        | 0.004          | 0.0003          | 0.0661          |
| SEP 11,84       | AUG 14,84        | < 0.001        | 0.0001          | 0.0646          |
| OCT 9,84        | SEP 11,84        | < 0.002        | 0.0001          | 0.0562          |
| NOV 6,84        | OCT 9,84         | 0.001          | 0.0001          | 0.0631          |
| DEC 3,84        | NOV 6,84         | < 0.000        | 0.0001          | 0.0417          |
| DEC 31,84       | DEC 3,84         | 0.000          | 0.0001          | 0.0282          |



ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : PORT STANLEY/CUMULATIVE PRECIP.

#03

PAGE : 1

| REMOVAL<br>DATE | EXPOSURE<br>DATE | SAMPLING<br>START<br>HR. | SAMPLING<br>END<br>HR. | SAMPLE<br>TYPE<br>01-RAIN<br>02-SNOW<br>03-COMP/04-OTHER | GAUGE<br>DEPTH(MM) | GAUGE<br>TYPE<br>00-APIOS<br>09-AES | SAMPLE<br>NUMBER | PROJECT<br>CODE<br>02-APIOS<br>03-SPECIAL | SUBPROJECT<br>CODE<br>01-MOE<br>03-AES | SAMPLER<br>EFFICI-<br>ENCY<br>(%) | COMMENTS<br>FIELD OFFICE |
|-----------------|------------------|--------------------------|------------------------|--|--------------------|-------------------------------------|------------------|---|--|-----------------------------------|--------------------------|
| JAN 31,84       | JAN 3,84         | 1330                     | 930                    | 3  | 30.0               | 0                                   | 19603            | 2   | 1                                      | U 82                              | CFJI H                   |
| FEB 28,84       | JAN 31,84        | 930                      | 930                    | 3  | 57.0               | 0                                   | 19618            | 2   | 1                                      | U 75                              | FCIJ                     |
| MAR 27,84       | FEB 28,84        | 930                      | 900                    | 3  | 37.0               | 0                                   | 19630            | 2   | 1                                      | U 96                              | FC                       |
| APR 24,84       | MAR 27,84        | 900                      | 900                    | 3  | 72.0               | 0                                   | 19643            | 2   | 1                                      | 75                                | CAD                      |
| MAY 22,84       | APR 24,84        | 900                      | 900                    | 1  | 63.0               | 0                                   | 19654            | 2   | 1                                      | U 62                              | CDFI                     |
| JUN 19,84       | MAY 22,84        | 900                      | 900                    | 1  | 178.0              | 0                                   | 19665            | 2   | 1                                      | U 69                              | IFCD                     |
| JUL 17,84       | JUN 19,84        | 900                      | 830                    | 1  | 78.0               | 0                                   | 19675            | 2   | 1                                      | 81                                | C                        |
| AUG 14,84       | JUL 17,84        | 830                      | 900                    | 1  | 64.0               | 9                                   | 19685            | 2   | 1                                      | 82                                | AD                       |
| SEP 11,84       | AUG 14,84        | 900                      | 900                    | 1  | 94.0               | 0                                   | 19699            | 2   | 1                                      | 90                                |                          |
| OCT 9,84        | SEP 11,84        | 900                      | 930                    | 1  | 66.0               | 0                                   | 19701            | 2   | 1                                      | 89                                |                          |
| NOV 6,84        | OCT 9,84         | 930                      | 1400                   | 3  | 64.0               | 0                                   | 19716            | 2   | 1                                      | 86                                |                          |
| DEC 4,84        | NOV 6,84         | 1400                     | 900                    | 3  | 57.6               | 9                                   | 19728            | 2   | 1                                      | 73                                | N                        |
| JAN 2,85        | DEC 4,84         | 900                      | 1430                   | 3  | 81.0               | 0                                   | 19742            | 2   | 1                                      | 87                                |                          |

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | VOLUME<br>ML | CONDUCT.<br>UMHO/CM | PH<br>LAB | TOTAL H+<br>TO PH8.3<br>MG/L | SULPHATE<br>MG/L | NITRATE<br>AS N<br>MG/L | CALCIUM<br>MG/L |
|-----------------|------------------|--------------|---------------------|-----------|------------------------------|------------------|-------------------------|-----------------|
| JAN 31,84       | JAN 3,84         | 799.0        | 25.5                | U 5.20    | 0.0492                       | 4.45             | 0.70                    | U 2.30          |
| FEB 28,84       | JAN 31,84        | 1393.0       | 29.6                | 4.27      | 0.0812                       | 2.85             | 0.54                    | 0.39            |
| MAR 27,84       | FEB 28,84        | 1157.0       | 33.7                | U 6.06    | 0.0296                       | 6.45             | 1.18                    | U 3.35          |
| APR 24,84       | MAR 27,84        | 1761.0       | 44.0                | 4.12      | 0.1056                       | 4.15             | 1.00                    | 0.54            |
| MAY 22,84       | APR 24,84        | 1283.0       | 26.8                | U 5.18    | 0.0286                       | 4.95             | 0.78                    | U 1.54          |
| JUN 19,84       | MAY 22,84        | 4002.0       | 57.2                | 3.95      | 0.1452                       | 6.10             | 0.66                    | 0.29            |
| JUL 17,84       | JUN 19,84        | 2057.0       | 42.9                | 4.08      | 0.1006                       | 4.45             | 0.56                    | 0.28            |
| AUG 14,84       | JUL 17,84        | 1705.0       | 56.0                | 4.12      | 0.1116                       | 5.70             | 0.80                    | 0.53            |
| SEP 11,84       | AUG 14,84        | 2767.0       | 49.2                | 4.04      | 0.1192                       | 5.10             | 0.57                    | 0.26            |
| OCT 9,84        | SEP 11,84        | 1913.0       | 41.0                | 4.11      | 0.1038                       | 4.20             | 0.55                    | 0.26            |
| NOV 6,84        | OCT 9,84         | 1800.0       | 38.4                | 4.16      | 0.0978                       | 3.55             | 0.46                    | 0.10            |
| DEC 4,84        | NOV 6,84         | 1375.0       | 43.6                | 4.08      | 0.1074                       | 3.55             | 0.77                    | 0.29            |
| JAN 2,85        | DEC 4,84         | 2310.0       | 27.9                | 4.30      | *****                        | 2.25             | 0.41                    | 0.09            |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : PORT STANLEY/CUMULATIVE PRECIP.

#03

PAGE : 2

| REMOVAL<br>DATE | EXPOSURE<br>DATE | CHLORIDE<br>MG/L | KJELDAHL<br>AS N<br>MG/L | MAGNESIM<br>MG/L | POTASSIM<br>MG/L | SODIUM<br>MG/L | AMMONIUM<br>AS N<br>MG/L | PHOSPHOR<br>MG/L |
|-----------------|------------------|------------------|--------------------------|------------------|------------------|----------------|--------------------------|------------------|
| JAN 31,84       | JAN 3,84         | U 1.13           | 1.20                     | 0.475            | <T 0.005         | U 0.710        | U 0.002                  | U 0.340          |
| FEB 28,84       | JAN 31,84        | 0.27             | 0.30                     | 0.070            | <T 0.010         | 0.145          | 0.212                    | 0.010            |
| MAR 27,84       | FEB 28,84        | 0.51             | 0.30                     | U 0.700          | 0.060            | 0.245          | 0.086                    | 0.028            |
| APR 24,84       | MAR 27,84        | 0.30             | 0.74                     | 0.110            | 0.070            | 0.095          | 0.655                    | 0.035            |
| MAY 22,84       | APR 24,84        | 0.26             | 0.85                     | U 0.310          | 0.100            | 0.090          | 0.710                    | 0.018            |
| JUN 19,84       | MAY 22,84        | 0.17             | 0.67                     | 0.050            | 0.070            | 0.035          | 0.525                    | 0.010            |
| JUL 17,84       | JUN 19,84        | 0.12             | 0.64                     | 0.055            | 0.045            | <T 0.010       | 0.535                    | 0.006            |
| AUG 14,84       | JUL 17,84        | 0.15             | 0.85                     | 0.095            | 0.050            | 0.030          | 0.850                    | 0.045            |
| SEP 11,84       | AUG 14,84        | 0.13             | 0.58                     | 0.045            | 0.030            | 0.040          | 0.530                    | <T 0.003         |
| OCT 9,84        | SEP 11,84        | 0.17             | 0.53                     | 0.040            | 0.040            | 0.090          | 0.465                    | 0.006            |
| NOV 6,84        | OCT 9,84         | 0.16             | 0.35                     | 0.010            | 0.080            | 0.125          | 0.325                    | <W 0.001         |
| DEC 4,84        | NOV 6,84         | 0.35             | 0.51                     | 0.045            | 0.075            | 0.135          | 0.445                    | 0.010            |
| JAN 2,85        | DEC 4,84         | 0.19             | 0.28                     | <T 0.010         | 0.030            | 0.080          | 0.230                    | 0.005            |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | MANGANSE<br>MG/L | NICKEL<br>MG/L | ZINC<br>MG/L | IRON<br>MG/L | LEAD<br>MG/L | VANADIUM<br>MG/L | ALUMINUM<br>MG/L |
|-----------------|------------------|------------------|----------------|--------------|--------------|--------------|------------------|------------------|
| JAN 31,84       | JAN 3,84         | 0.008            | 0.002          | 0.051        | 0.170        | 0.020        | < 0.002          | U 0.176          |
| FEB 28,84       | JAN 31,84        | 0.002            | < 0.001        | 0.008        | 0.028        | 0.006        | < 0.002          | 0.028            |
| MAR 27,84       | FEB 28,84        | 0.003            | < 0.001        | 0.014        | U 0.248      | 0.006        | < 0.002          | U 0.264          |
| APR 24,84       | MAR 27,84        | 0.004            | < 0.001        | 0.008        | 0.048        | 0.011        | < 0.002          | 0.046            |
| MAY 22,84       | APR 24,84        | U 0.019          | < 0.001        | 0.010        | U 0.241      | 0.009        | < 0.002          | U 0.258          |
| JUN 19,84       | MAY 22,84        | 0.006            | < 0.001        | 0.004        | 0.052        | 0.005        | < 0.002          | 0.055            |
| JUL 17,84       | JUN 19,84        | 0.003            | < 0.001        | 0.006        | 0.025        | 0.001        | < 0.002          | 0.045            |
| AUG 14,84       | JUL 17,84        | 0.003            | < 0.001        | 0.008        | 0.037        | 0.011        | < 0.002          | 0.036            |
| SEP 11,84       | AUG 14,84        | 0.005            | < 0.001        | 0.005        | 0.030        | 0.008        | < 0.002          | 0.050            |
| OCT 9,84        | SEP 11,84        | 0.003            | < 0.001        | 0.006        | 0.016        | 0.011        | < 0.002          | 0.029            |
| NOV 6,84        | OCT 9,84         | 0.002            | 0.000          | 0.006        | 0.018        | 0.005        | < 0.000          | 0.019            |
| DEC 4,84        | NOV 6,84         | 0.004            | 0.000          | 0.010        | 0.025        | 0.007        | 0.001            | 0.032            |
| JAN 2,85        | DEC 4,84         | 0.002            | 0.000          | 0.003        | 0.018        | 0.005        | < 0.000          | 0.017            |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

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STATION NAME : PORT STANLEY/CUMULATIVE PRECIP.

#03

PAGE : 3

| REMOVAL<br>DATE | EXPOSURE<br>DATE | COPPER<br>MG/L | CADMIUM<br>MG/L | FREE H+<br>MG/L |
|-----------------|------------------|----------------|-----------------|-----------------|
| JAN 31,84       | JAN 3,84         | 0.002          | 0.0002          | U 0.0063        |
| FEB 28,84       | JAN 31,84        | < 0.002        | 0.0001          | 0.0537          |
| MAR 27,84       | FEB 28,84        | < 0.002        | 0.0001          | U 0.0009        |
| APR 24,84       | MAR 27,84        | < 0.002        | < 0.0001        | 0.0759          |
| MAY 22,84       | APR 24,84        | 0.001          | 0.0001          | U 0.0066        |
| JUN 19,84       | MAY 22,84        | < 0.001        | 0.0001          | 0.1122          |
| JUL 17,84       | JUN 19,84        | < 0.001        | 0.0001          | 0.0832          |
| AUG 14,84       | JUL 17,84        | 0.002          | < 0.0001        | 0.0759          |
| SEP 11,84       | AUG 14,84        | < 0.001        | 0.0002          | 0.0912          |
| OCT 9,84        | SEP 11,84        | < 0.002        | 0.0001          | 0.0776          |
| NOV 6,84        | OCT 9,84         | < 0.000        | 0.0001          | 0.0692          |
| DEC 4,84        | NOV 6,84         | 0.001          | 0.0003          | 0.0832          |
| JAN 2,85        | DEC 4,84         | < 0.000        | 0.0001          | 0.0501          |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : SHALLOW LAKE/CUMULATIVE PRECIP.

#09

PAGE : 1

| REMOVAL<br>DATE | EXPOSURE<br>DATE | SAMPLING<br>START<br>HR. | SAMPLING<br>END<br>HR. | SAMPLE<br>TYPE<br>01-RAIN<br>02-SNOW<br>03-COMP/04-OTHER | GAUGE<br>DEPTH(MM) | GAUGE<br>TYPE<br>00-APIOS<br>09-AES | SAMPLE<br>NUMBER | PROJECT<br>CODE<br>02-APIOS<br>03-SPECIAL | SUBPROJECT<br>CODE<br>01-MOE<br>03-AES | SAMPLER<br>EFFICI-<br>ENCY<br>(%) | COMMENTS<br>FIELD OFFICE |
|-----------------|------------------|--------------------------|------------------------|--|--------------------|-------------------------------------|------------------|---|--|-----------------------------------|--------------------------|
| JAN 31,84       | JAN 3,84         | 830                      | 840                    | 3  | 46.0               | 0                                   | 19609            | 2   | 1                                      | 56                                |                          |
| FEB 28,84       | JAN 31,84        | 840                      | 830                    | 3  | 48.0               | 0                                   | 19622            | 2   | 1                                      | 77                                |                          |
| MAR 27,84       | FEB 28,84        | 830                      | 830                    | 3  | 67.0               | 0                                   | 19634            | 2   | 1                                      | 76                                | D                        |
| APR 25,84       | MAR 27,84        | 830                      | 1740                   | 1  | 73.0               | 0                                   | 19647            | 2   | 1                                      | 79                                | ACD                      |
| MAY 22,84       | APR 25,84        | 1740                     | 715                    | 1  | 23.8               | 9                                   | 19658            | 2   | 1                                      | 72                                | CD H                     |
| JUN 19,84       | MAY 22,84        | 715                      | 830                    | 1  | 91.0               | 0                                   | 19669            | 2   | 1                                      | U 81                              | FCD                      |
| JUL 17,84       | JUN 19,84        | 830                      | 1700                   | 1  | 67.0               | 0                                   | 19679            | 2   | 1                                      | 51                                | CD                       |
| AUG 14,84       | JUL 17,84        | 1700                     | 830                    | 1  | 26.0               | 9                                   | 19689            | 2   | 1                                      | 98                                | NC                       |
| SEP 11,84       | AUG 14,84        | 830                      | 845                    | 1  | 140.0              | 0                                   | 19697            | 2   | 1                                      | 53                                |                          |
| OCT 9,84        | SEP 11,84        | 845                      | 800                    | 1  | 85.0               | 0                                   | 19698            | 2   | 1                                      | 140                               | N                        |
| NOV 6,84        | OCT 9,84         | 800                      | 830                    | 3  | 70.0               | 0                                   | 19720            | 2   | 1                                      | U 72                              | F                        |
| DEC 5,84        | NOV 6,84         | 830                      | 830                    | 3  | 70.0               | 0                                   | 19732            | 2   | 1                                      | 67                                |                          |
| JAN 2,85        | DEC 5,84         | 830                      | 730                    | 2  | 108.0              | 0                                   | 19761            | 2   | 1                                      | 80                                |                          |

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | VOLUME<br>ML | CONDUCT.<br>UMHO/CM | PH<br>LAB | TOTAL H+<br>TO PH8.3<br>MG/L | SULPHATE<br>MG/L | NITRATE<br>AS N<br>MG/L | CALCIUM<br>MG/L |
|-----------------|------------------|--------------|---------------------|-----------|------------------------------|------------------|-------------------------|-----------------|
| JAN 31,84       | JAN 3,84         | 839.0        | 34.8                | 4.22      | 0.0950                       | 1.85             | 0.91                    | 0.14            |
| FEB 28,84       | JAN 31,84        | 1209.0       | 35.8                | 4.15      | 0.1030                       | 2.45             | 0.81                    | 0.13            |
| MAR 27,84       | FEB 28,84        | 1664.0       | 44.5                | 4.13      | 0.1104                       | 3.85             | 0.74                    | 0.37            |
| APR 25,84       | MAR 27,84        | 1887.0       | 20.1                | 4.44      | 0.0646                       | 1.95             | 0.29                    | 0.09            |
| MAY 22,84       | APR 25,84        | 563.0        | 27.4                | U 5.90    | 0.0264                       | 5.65             | 0.83                    | 1.61            |
| JUN 19,84       | MAY 22,84        | 2414.0       | 28.0                | 4.32      | 0.0666                       | 3.25             | 0.44                    | 0.28            |
| JUL 17,84       | JUN 19,84        | 1119.0       | 40.5                | 4.16      | 0.0920                       | 4.75             | 0.62                    | 0.50            |
| AUG 14,84       | JUL 17,84        | 830.0        | 20.9                | 4.55      | 0.0598                       | 4.25             | 0.59                    | 0.87            |
| SEP 11,84       | AUG 14,84        | 2412.0       | 36.0                | 4.20      | 0.0850                       | 3.70             | 0.51                    | 0.25            |
| OCT 9,84        | SEP 11,84        | 3880.0       | 36.9                | 4.20      | 0.0900                       | 3.80             | 0.43                    | 0.21            |
| NOV 6,84        | OCT 9,84         | 1654.0       | 43.3                | 4.13      | 0.1054                       | 3.90             | 0.63                    | 0.20            |
| DEC 5,84        | NOV 6,84         | 1535.0       | 26.1                | 4.35      | 0.0662                       | 2.15             | 0.52                    | 0.19            |
| JAN 2,85        | DEC 5,84         | 2840.0       | 21.2                | 4.51      | *****                        | 1.85             | 0.45                    | 0.10            |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : SHALLOW LAKE/CUMULATIVE PRECIP.

#09

PAGE : 2

| REMOVAL<br>DATE | EXPOSURE<br>DATE | CHLORIDE<br>MG/L | KJELDAHL<br>AS N<br>MG/L | MAGNESIM<br>MG/L | POTASSIM<br>MG/L | SODIUM<br>MG/L | AMMONIUM<br>AS N<br>MG/L | PHOSPHOR<br>MG/L |
|-----------------|------------------|------------------|--------------------------|------------------|------------------|----------------|--------------------------|------------------|
| JAN 31,84       | JAN 3,84         | 0.28             | 0.48                     | 0.025            | <T 0.005         | 0.115          | *****                    | 0.015            |
| FEB 28,84       | JAN 31,84        | 0.14             | 0.38                     | 0.020            | <T 0.015         | 0.065          | 0.328                    | 0.008            |
| MAR 27,84       | FEB 28,84        | 0.18             | 0.38                     | 0.100            | <T 0.010         | 0.090          | 0.324                    | <T 0.004         |
| APR 25,84       | MAR 27,84        | 0.10             | 0.24                     | 0.015            | 0.020            | <T 0.010       | 0.210                    | 0.013            |
| MAY 22,84       | APR 25,84        | 0.25             | 1.73                     | 0.400            | 0.115            | 0.105          | 1.100                    | U 0.095          |
| JUN 19,84       | MAY 22,84        | 0.14             | 0.73                     | 0.070            | 0.025            | 0.065          | 0.460                    | 0.010            |
| JUL 17,84       | JUN 19,84        | 0.13             | 0.77                     | 0.115            | 0.040            | <T 0.010       | 0.630                    | 0.007            |
| AUG 14,84       | JUL 17,84        | 0.15             | 0.59                     | 0.245            | 0.035            | 0.085          | 0.555                    | 0.005            |
| SEP 11,84       | AUG 14,84        | 0.12             | 0.45                     | 0.045            | 0.025            | 0.030          | 0.430                    | <T 0.002         |
| OCT 9,84        | SEP 11,84        | 0.07             | 0.47                     | 0.040            | 0.025            | <T 0.015       | 0.420                    | 0.005            |
| NOV 6,84        | OCT 9,84         | 0.18             | 0.48                     | 0.045            | 0.030            | 0.050          | 0.455                    | <W 0.001         |
| DEC 5,84        | NOV 6,84         | 0.14             | 0.44                     | 0.025            | 0.035            | 0.045          | 0.400                    | 0.005            |
| JAN 2,85        | DEC 5,84         | 0.14             | 0.45                     | 0.020            | 0.030            | 0.060          | 0.400                    | 0.007            |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | MANGANSE<br>MG/L | NICKEL<br>MG/L | ZINC<br>MG/L | IRON<br>MG/L | LEAD<br>MG/L | VANADIUM<br>MG/L | ALUMINUM<br>MG/L |
|-----------------|------------------|------------------|----------------|--------------|--------------|--------------|------------------|------------------|
| JAN 31,84       | JAN 3,84         | 0.002            | < 0.001        | 0.008        | 0.020        | 0.009        | < 0.002          | 0.032            |
| FEB 28,84       | JAN 31,84        | 0.001            | < 0.001        | 0.007        | 0.015        | 0.007        | < 0.002          | 0.018            |
| MAR 27,84       | FEB 28,84        | 0.005            | < 0.001        | 0.007        | 0.034        | 0.008        | < 0.002          | 0.046            |
| APR 25,84       | MAR 27,84        | 0.001            | < 0.001        | 0.003        | 0.043        | 0.009        | < 0.002          | 0.007            |
| MAY 22,84       | APR 25,84        | U 0.028          | < 0.001        | U 0.030      | U 0.496      | 0.021        | < 0.002          | U 0.490          |
| JUN 19,84       | MAY 22,84        | 0.003            | < 0.001        | 0.003        | 0.043        | 0.004        | < 0.002          | 0.050            |
| JUL 17,84       | JUN 19,84        | 0.004            | < 0.001        | 0.007        | 0.032        | 0.002        | < 0.002          | 0.066            |
| AUG 14,84       | JUL 17,84        | 0.005            | < 0.001        | 0.005        | 0.057        | 0.020        | < 0.002          | 0.048            |
| SEP 11,84       | AUG 14,84        | 0.003            | < 0.001        | 0.004        | 0.015        | 0.004        | < 0.002          | 0.032            |
| OCT 9,84        | SEP 11,84        | 0.003            | < 0.001        | 0.005        | 0.020        | 0.009        | < 0.002          | 0.031            |
| NOV 6,84        | OCT 9,84         | 0.002            | 0.000          | 0.006        | 0.025        | 0.008        | 0.001            | 0.029            |
| DEC 5,84        | NOV 6,84         | 0.002            | < 0.000        | 0.005        | 0.014        | 0.005        | < 0.000          | 0.023            |
| JAN 2,85        | DEC 5,84         | 0.002            | < 0.000        | 0.003        | 0.025        | 0.006        | 0.000            | 0.028            |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

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| STATION NAME : SHALLOW LAKE/CUMULATIVE PRECIP. |                  | #09            |                 | PAGE : 3        |
|--|------------------|----------------|-----------------|-----------------|
| REMOVAL<br>DATE                                | EXPOSURE<br>DATE | COPPER<br>MG/L | CADMIUM<br>MG/L | FREE H+<br>MG/L |
| JAN 31,84                                      | JAN 3,84         | < 0.002        | 0.0001          | 0.0603          |
| FEB 28,84                                      | JAN 31,84        | < 0.002        | < 0.0001        | 0.0708          |
| MAR 27,84                                      | FEB 28,84        | < 0.002        | 0.0001          | 0.0741          |
| APR 25,84                                      | MAR 27,84        | < 0.002        | < 0.0001        | 0.0363          |
| MAY 22,84                                      | APR 25,84        | 0.005          | 0.0001          | U 0.0013        |
| JUN 19,84                                      | MAY 22,84        | < 0.001        | 0.0001          | 0.0479          |
| JUL 17,84                                      | JUN 19,84        | < 0.002        | 0.0001          | 0.0692          |
| AUG 14,84                                      | JUL 17,84        | < 0.002        | 0.0005          | 0.0282          |
| SEP 11,84                                      | AUG 14,84        | < 0.001        | 0.0001          | 0.0631          |
| OCT 9,84                                       | SEP 11,84        | < 0.001        | 0.0001          | 0.0631          |
| NOV 6,84                                       | OCT 9,84         | < 0.000        | 0.0002          | 0.0741          |
| DEC 5,84                                       | NOV 6,84         | 0.001          | 0.0001          | 0.0447          |
| JAN 2,85                                       | DEC 5,84         | < 0.000        | 0.0001          | 0.0309          |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : WATERLOO/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | SAMPLING<br>START<br>HR. | SAMPLING<br>END<br>HR. | SAMPLE<br>TYPE<br>01-RAIN<br>02-SNOW<br>03-COMP/04-OTHER | GAUGE<br>DEPTH(MM) | GAUGE<br>TYPE<br>00-APIOS<br>09-AES | SAMPLE<br>NUMBER | PROJECT<br>CODE<br>02-APIOS<br>03-SPECIAL | SUBPROJECT<br>CODE<br>01-MOE<br>03-AES | SAMPLER<br>EFFICI-<br>ENCY<br>(%) | COMMENTS<br>FIELD OFFICE |
|-----------------|------------------|--------------------------|------------------------|--|--------------------|-------------------------------------|------------------|---|--|-----------------------------------|--------------------------|
| JAN 31,84       | JAN 3,84         | 830                      | 840                    | 2  | 31.0               | 0                                   | 19611            | 2   | 1                                      | 58                                |                          |
| FEB 28,84       | JAN 31,84        | 840                      | 820                    | 3  | 60.0               | 0                                   | 19624            | 2   | 1                                      | 67                                |                          |
| MAR 26,84       | FEB 28,84        | 820                      | 825                    | 3  | 66.0               | 0                                   | 19636            | 2   | 1                                      | 76                                | D                        |
| APR 24,84       | MAR 27,84        | 825                      | 820                    | 3  | 41.0               | 0                                   | 19649            | 2   | 1                                      | 80                                | ABCD HCM                 |
| MAY 22,84       | APR 24,84        | 820                      | 815                    | 1  | 42.0               | 0                                   | 19660            | 2   | 1                                      | 78                                | ABC                      |
| JUN 19,84       | MAY 22,84        | 815                      | 820                    | 1  | 129.0              | 0                                   | 19671            | 2   | 1                                      | 65                                | ACD                      |
| JUL 17,84       | JUN 19,84        | 820                      | 830                    | 1  | 41.0               | 0                                   | 19681            | 2   | 1                                      | 80                                |                          |
| AUG 14,84       | JUL 17,84        | 830                      | 820                    | 1  | 88.0               | 0                                   | 19691            | 2   | 1                                      | 85                                |                          |
| SEP 11,84       | AUG 14,84        | 820                      | 930                    | 1  | 120.0              | 0                                   | 19695            | 2   | 1                                      | U 32                              | CG N                     |
| OCT 9,84        | SEP 11,84        | 930                      | 830                    | 3  | 69.0               | 0                                   | 19721            | 2   | 1                                      | 84                                |                          |
| NOV 6,84        | OCT 9,84         | 830                      | 820                    | 3  | 53.0               | 0                                   | 19722            | 2   | 1                                      | 87                                |                          |
| DEC 4,84        | NOV 6,84         | 820                      | 900                    | 3  | 65.0               | 0                                   | 19734            | 2   | 1                                      | 93                                |                          |
| JAN 1,85        | DEC 4,84         | 900                      | 930                    | 3  | 84.0               | 0                                   | 19752            | 2   | 1                                      | 87                                |                          |

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | VOLUME<br>ML | CONDUCT.<br>UMHO/CM | PH<br>LAB | TOTAL H+<br>TO PH8.3<br>MG/L | SULPHATE<br>MG/L | NITRATE<br>AS N<br>MG/L | CALCIUM<br>MG/L |
|-----------------|------------------|--------------|---------------------|-----------|------------------------------|------------------|-------------------------|-----------------|
| JAN 31,84       | JAN 3,84         | 589.0        | 35.2                | 4.23      | 0.0950                       | 2.20             | 0.93                    | 0.22            |
| FEB 28,84       | JAN 31,84        | 1317.0       | 28.0                | 4.28      | 0.0816                       | 2.40             | 0.50                    | 0.17            |
| MAR 26,84       | FEB 28,84        | 1632.0       | 36.6                | 4.23      | 0.0898                       | 3.65             | 0.52                    | 0.45            |
| APR 24,84       | MAR 27,84        | 1071.0       | G 79.1              | U 7.70    | 0.0488                       | 4.50             | 0.36                    | U 6.00          |
| MAY 22,84       | APR 24,84        | 1066.0       | 33.5                | U 7.20    | 0.0248                       | 5.45             | 0.73                    | U 1.53          |
| JUN 19,84       | MAY 22,84        | 2749.0       | 27.6                | 4.39      | 0.0684                       | 3.95             | 0.52                    | 0.51            |
| JUL 17,84       | JUN 19,84        | 1070.0       | 45.0                | 4.14      | 0.0972                       | 5.75             | 0.68                    | 0.62            |
| AUG 14,84       | JUL 17,84        | 2430.0       | 47.0                | 4.10      | 0.1126                       | 4.30             | 0.66                    | 0.38            |
| SEP 11,84       | AUG 14,84        | 1256.0       | 41.4                | 4.16      | 0.0980                       | 4.55             | 0.51                    | 0.25            |
| OCT 9,84        | SEP 11,84        | 1902.0       | 36.7                | 4.25      | 0.0852                       | 3.85             | 0.58                    | 0.33            |
| NOV 6,84        | OCT 9,84         | 1503.0       | 40.6                | 4.19      | 0.1004                       | 3.90             | 0.57                    | 0.24            |
| DEC 4,84        | NOV 6,84         | 1975.0       | 32.0                | 4.20      | 0.0832                       | 2.85             | 0.59                    | 0.20            |
| JAN 1,85        | DEC 4,84         | 2400.0       | 21.0                | 4.51      | *****                        | 2.20             | 0.39                    | 0.27            |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : WATERLOO/CUMULATIVE PRECIP.

#07

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | CHLORIDE<br>MG/L | KJELDAHL<br>AS N<br>MG/L | MAGNESIM<br>MG/L | POTASSIM<br>MG/L | SODIUM<br>MG/L | AMMONIUM<br>AS N<br>MG/L | PHOSPHOR<br>MG/L |
|-----------------|------------------|------------------|--------------------------|------------------|------------------|----------------|--------------------------|------------------|
| JAN 31,84       | JAN 3,84         | 0.45             | 0.71                     | 0.030            | 0.030            | 0.195          | *****                    | 0.024            |
| FEB 28,84       | JAN 31,84        | 0.19             | 0.27                     | 0.025            | <T 0.010         | 0.075          | 0.240                    | 0.009            |
| MAR 26,84       | FEB 28,84        | 0.26             | 0.34                     | 0.115            | <T 0.010         | 0.125          | 0.274                    | 0.005            |
| APR 24,84       | MAR 27,84        | 0.51             | 0.28                     | U 0.950          | U 0.750          | 0.230          | U 5.000                  | 0.026            |
| MAY 22,84       | APR 24,84        | 0.25             | U 2.40                   | U 0.420          | 0.165            | 0.075          | U 2.000                  | U 0.152          |
| JUN 19,84       | MAY 22,84        | 0.11             | 0.91                     | 0.125            | 0.030            | 0.040          | 0.630                    | 0.023            |
| JUL 17,84       | JUN 19,84        | 0.17             | 1.13                     | 0.125            | 0.110            | 0.065          | 0.905                    | 0.015            |
| AUG 14,84       | JUL 17,84        | 0.14             | 0.52                     | 0.095            | 0.065            | 0.015          | 0.370                    | 0.012            |
| SEP 11,84       | AUG 14,84        | 0.11             | 0.64                     | 0.045            | 0.035            | <T 0.015       | 0.585                    | <T 0.003         |
| OCT 9,84        | SEP 11,84        | 0.14             | 0.60                     | 0.040            | 0.015            | 0.050          | 0.555                    | <T 0.002         |
| NOV 6,84        | OCT 9,84         | 0.19             | 0.49                     | 0.050            | 0.015            | 0.045          | 0.450                    | <W 0.001         |
| DEC 4,84        | NOV 6,84         | 0.24             | 0.52                     | 0.040            | 0.015            | 0.085          | 0.470                    | 0.008            |
| JAN 1,85        | DEC 4,84         | 0.21             | 0.37                     | 0.075            | 0.025            | 0.105          | 0.320                    | 0.006            |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | MANGANSE<br>MG/L | NICKEL<br>MG/L | ZINC<br>MG/L | IRON<br>MG/L | LEAD<br>MG/L | VANADIUM<br>MG/L | ALUMINUM<br>MG/L |
|-----------------|------------------|------------------|----------------|--------------|--------------|--------------|------------------|------------------|
| JAN 31,84       | JAN 3,84         | 0.002            | < 0.001        | 0.013        | 0.049        | 0.014        | < 0.002          | 0.055            |
| FEB 28,84       | JAN 31,84        | 0.002            | < 0.001        | 0.008        | 0.023        | 0.015        | < 0.002          | 0.018            |
| MAR 26,84       | FEB 28,84        | 0.005            | < 0.001        | 0.007        | 0.050        | 0.006        | < 0.002          | 0.071            |
| APR 24,84       | MAR 27,84        | 0.017            | < 0.001        | 0.025        | 0.187        | 0.012        | < 0.002          | 0.139            |
| MAY 22,84       | APR 24,84        | U 0.032          | < 0.001        | 0.013        | U 0.461      | 0.011        | < 0.002          | U 0.455          |
| JUN 19,84       | MAY 22,84        | 0.005            | < 0.001        | 0.004        | 0.128        | 0.007        | < 0.002          | 0.163            |
| JUL 17,84       | JUN 19,84        | 0.004            | < 0.001        | 0.011        | 0.044        | 0.002        | < 0.002          | 0.070            |
| AUG 14,84       | JUL 17,84        | 0.004            | < 0.001        | 0.007        | 0.043        | 0.010        | < 0.002          | 0.029            |
| SEP 11,84       | AUG 14,84        | 0.004            | < 0.001        | 0.007        | G 0.210      | 0.016        | < 0.002          | 0.090            |
| OCT 9,84        | SEP 11,84        | 0.003            | 0.000          | 0.007        | 0.027        | 0.005        | < 0.000          | 0.021            |
| NOV 6,84        | OCT 9,84         | 0.003            | 0.000          | 0.007        | 0.031        | 0.007        | 0.000            | 0.018            |
| DEC 4,84        | NOV 6,84         | 0.003            | < 0.000        | 0.007        | 0.022        | 0.008        | 0.000            | 0.028            |
| JAN 1,85        | DEC 4,84         | 0.002            | 0.000          | 0.006        | 0.047        | 0.017        | < 0.000          | 0.029            |



ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

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STATION NAME : WATERLOO/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | COPPER<br>MG/L | CADMIUM<br>MG/L | FREE H+<br>MG/L |
|-----------------|------------------|----------------|-----------------|-----------------|
| JAN 31,84       | JAN 3,84         | 0.004          | 0.0002          | 0.0589          |
| FEB 28,84       | JAN 31,84        | < 0.002        | < 0.0001        | 0.0525          |
| MAR 26,84       | FEB 28,84        | < 0.002        | 0.0001          | 0.0589          |
| APR 24,84       | MAR 27,84        | 0.005          | < 0.0001        | U 0.0000        |
| MAY 22,84       | APR 24,84        | 0.004          | 0.0002          | U 0.0001        |
| JUN 19,84       | MAY 22,84        | 0.001          | 0.0001          | 0.0407          |
| JUL 17,84       | JUN 19,84        | 0.001          | 0.0001          | 0.0724          |
| AUG 14,84       | JUL 17,84        | < 0.001        | < 0.0001        | 0.0794          |
| SEP 11,84       | AUG 14,84        | < 0.002        | 0.0001          | 0.0692          |
| OCT 9,84        | SEP 11,84        | 0.001          | 0.0001          | 0.0562          |
| NOV 6,84        | OCT 9,84         | 0.001          | 0.0001          | 0.0646          |
| DEC 4,84        | NOV 6,84         | 0.001          | 0.0002          | 0.0631          |
| JAN 1,85        | DEC 4,84         | 0.001          | 0.0001          | 0.0309          |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : WILKESPORT/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | SAMPLING<br>START<br>HR. | END<br>HR. | SAMPLE<br>TYPE<br>01-RAIN<br>02-SNOW<br>03-COMP/04-OTHER | GAUGE<br>DEPTH(MM) | GAUGE<br>TYPE<br>00-APIOS<br>09-AES | SAMPLE<br>NUMBER | PROJECT<br>CODE<br>02-APIOS<br>03-SPECIAL | SUBPROJECT<br>CODE<br>01-MOE<br>03-AES | SAMPLER<br>EFFICI-<br>ENCY<br>(%) | COMMENTS<br>FIELD OFFICE |
|-----------------|------------------|--------------------------|------------|--|--------------------|-------------------------------------|------------------|---|--|-----------------------------------|--------------------------|
| JAN 31,84       | JAN 3,84         | 1300                     | 1300       | 2  | 23.8               | 9                                   | 19606            | 2   | 1                                      | 24                                | FI                       |
| MAR 1,84        | JAN 31,84        | 1300                     | 930        | 3  | *****              | *                                   | 19620            | 2   | 1                                      | ***                               | FC                       |
| MAR 27,84       | MAR 1,84         | 930                      | 1230       | 1  | 100.0              | 0                                   | 19632            | 2   | 1                                      | U 47                              | FJD                      |
| APR 24,84       | MAR 27,84        | 1230                     | 930        | 1  | 54.0               | 0                                   | 19645            | 2   | 1                                      | 86                                | CD                       |
| MAY 22,84       | APR 24,84        | 930                      | 1130       | 1  | 27.0               | 0                                   | 19656            | 2   | 1                                      | U 76                              | ACDG                     |
| JUN 19,84       | MAY 22,84        | 1130                     | 1330       | 1  | 74.0               | 0                                   | 19667            | 2   | 1                                      | U 0                               | EJABCD                   |
| JUL 17,84       | JUN 19,84        | 1330                     | 1200       | 1  | 45.0               | 0                                   | 19677            | 2   | 1                                      | U 81                              | FIACD                    |
| AUG 14,84       | JUL 17,84        | 1200                     | 1230       | 1  | 20.0               | 0                                   | 19687            | 2   | 1                                      | 86                                |                          |
| SEP 11,84       | AUG 14,84        | 1230                     | 1400       | 1  | 79.0               | 0                                   | 19711            | 2   | 1                                      | U 5                               | G N                      |
| OCT 9,84        | SEP 11,84        | 1400                     | 1030       | 1  | 79.0               | 0                                   | 19705            | 2   | 1                                      | U 80                              | FAC                      |
| NOV 6,84        | OCT 9,84         | 1030                     | 1400       | 3  | 40.0               | 0                                   | 19715            | 2   | 1                                      | U 45                              | FI                       |
| DEC 6,84        | NOV 6,84         | 1400                     | 1300       | 3  | 38.0               | 0                                   | 19731            | 2   | 1                                      | U 20                              | ACFI                     |
| JAN 2,85        | DEC 6,84         | 1300                     | 1430       | 3  | 93.0               | 0                                   | 19747            | 2   | 1                                      | 89                                |                          |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | VOLUME<br>ML | CONDUCT.<br>UMHO/CM | PH<br>LAB | TOTAL H+<br>TO PH8.3<br>MG/L | SULPHATE<br>MG/L | NITRATE<br>AS N<br>MG/L | CALCIUM<br>MG/L |
|-----------------|------------------|--------------|---------------------|-----------|------------------------------|------------------|-------------------------|-----------------|
| JAN 31,84       | JAN 3,84         | 190.0        | G 62.5              | 4.10      | D 0.1358                     | 5.05             | G 1.78                  | 0.98            |
| MAR 1,84        | JAN 31,84        | 659.0        | 28.3                | U 4.44    | 0.0690                       | 3.65             | 0.48                    | 0.78            |
| MAR 27,84       | MAR 1,84         | 1527.0       | 35.8                | 4.31      | 0.0838                       | 4.20             | 0.52                    | 0.84            |
| APR 24,84       | MAR 27,84        | 1521.0       | 53.0                | 4.00      | 0.1334                       | 4.65             | 1.14                    | 0.70            |
| MAY 22,84       | APR 24,84        | 671.0        | 43.0                | U 7.45    | 0.0192                       | 8.15             | 1.22                    | U 4.00          |
| JUN 19,84       | MAY 22,84        | 0.0          | *****               | *****     | *****                        | *****            | *****                   | *****           |
| JUL 17,84       | JUN 19,84        | 1184.0       | 44.5                | 4.27      | 0.0782                       | 6.85             | 0.88                    | 1.60            |
| AUG 14,84       | JUL 17,84        | 562.0        | > 100.0             | 3.68      | G 0.2540                     | G 11.80          | G 1.63                  | 1.18            |
| SEP 11,84       | AUG 14,84        | 141.0        | 38.6                | 4.11      | 0.1144                       | 4.55             | 0.45                    | 0.26            |
| OCT 9,84        | SEP 11,84        | 2069.0       | 19.6                | B 4.76    | 0.0494                       | 3.35             | 0.30                    | 0.23            |
| NOV 6,84        | OCT 9,84         | 591.0        | 81.8                | 3.81      | G 0.1988                     | 7.30             | D 1.13                  | 0.36            |
| DEC 6,84        | NOV 6,84         | 250.0        | 32.7                | 4.19      | 0.0862                       | 2.20             | 0.63                    | D 0.45          |
| JAN 2,85        | DEC 6,84         | 2693.0       | D 27.6              | 4.39      | *****                        | 2.60             | 0.43                    | 0.36            |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : WILKESPORT/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | CHLORIDE<br>MG/L | KJELDAHL<br>AS N<br>MG/L | MAGNESIM<br>MG/L | POTASSIM<br>MG/L | SODIUM<br>MG/L | AMMONIUM<br>AS N<br>MG/L | PHOSPHOR<br>MG/L |
|-----------------|------------------|------------------|--------------------------|------------------|------------------|----------------|--------------------------|------------------|
| JAN 31,84       | JAN 3,84         | U 2.36           | 1.51                     | 0.185            | 0.030            | U 1.380        | 0.840                    | D 0.057          |
| MAR 1,84        | JAN 31,84        | 0.73             | U 2.32                   | 0.115            | U 0.390          | U 0.470        | 0.128                    | 0.013            |
| MAR 27,84       | MAR 1,84         | 0.25             | 0.29                     | 0.085            | <T 0.005         | 0.130          | 0.258                    | <T 0.001         |
| APR 24,84       | MAR 27,84        | 0.43             | <W 0.01                  | 0.090            | 0.030            | 0.065          | 0.560                    | <W 0.001         |
| MAY 22,84       | APR 24,84        | 0.51             | 1.66                     | U 0.600          | 0.110            | 0.195          | 1.300                    | 0.030            |
| JUN 19,84       | MAY 22,84        | *****            | *****                    | *****            | *****            | *****          | *****                    | *****            |
| JUL 17,84       | JUN 19,84        | 0.24             | 1.09                     | 0.215            | 0.080            | 0.065          | 0.910                    | 0.009            |
| AUG 14,84       | JUL 17,84        | 0.38             | 1.15                     | 0.230            | 0.090            | 0.080          | 1.050                    | 0.018            |
| SEP 11,84       | AUG 14,84        | 0.14             | 0.59                     | 0.045            | 0.025            | <T 0.015       | 0.535                    | 0.005            |
| OCT 9,84        | SEP 11,84        | 0.22             | 0.96                     | 0.050            | D 0.180          | 0.090          | 0.795                    | B 0.080          |
| NOV 6,84        | OCT 9,84         | D 0.49           | D 0.75                   | 0.055            | 0.075            | D 0.145        | D 0.665                  | 0.005            |
| DEC 6,84        | NOV 6,84         | 0.34             | 0.37                     | D 0.060          | D 0.125          | 0.175          | 0.105                    | D 0.040          |
| JAN 2,85        | DEC 6,84         | 0.61             | 0.65                     | 0.060            | 0.110            | 0.180          | 0.345                    | 0.015            |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | MANGANSE<br>MG/L | NICKEL<br>MG/L | ZINC<br>MG/L | IRON<br>MG/L | LEAD<br>MG/L | VANADIUM<br>MG/L | ALUMINUM<br>MG/L |
|-----------------|------------------|------------------|----------------|--------------|--------------|--------------|------------------|------------------|
| JAN 31,84       | JAN 3,84         | *****            | *****          | *****        | *****        | *****        | *****            | *****            |
| MAR 1,84        | JAN 31,84        | 0.003            | 0.003          | 0.033        | 0.063        | 0.023        | < 0.002          | 0.043            |
| MAR 27,84       | MAR 1,84         | 0.003            | < 0.001        | 0.008        | 0.043        | 0.007        | < 0.002          | 0.055            |
| APR 24,84       | MAR 27,84        | 0.004            | < 0.001        | 0.011        | 0.058        | 0.012        | < 0.002          | 0.061            |
| MAY 22,84       | APR 24,84        | U 0.023          | < 0.001        | 0.019        | U 0.520      | 0.015        | < 0.002          | U 0.490          |
| JUN 19,84       | MAY 22,84        | *****            | *****          | *****        | *****        | *****        | *****            | *****            |
| JUL 17,84       | JUN 19,84        | 0.007            | < 0.001        | 0.010        | 0.097        | 0.005        | < 0.002          | 0.100            |
| AUG 14,84       | JUL 17,84        | 0.007            | < 0.001        | 0.020        | 0.106        | G 0.023      | < 0.002          | 0.103            |
| SEP 11,84       | AUG 14,84        | 0.004            | < 0.001        | D 0.026      | U 0.411      | B 0.028      | < 0.002          | U 0.334          |
| OCT 9,84        | SEP 11,84        | 0.002            | < 0.001        | 0.018        | 0.014        | 0.006        | < 0.002          | 0.029            |
| NOV 6,84        | OCT 9,84         | 0.004            | 0.001          | 0.016        | 0.037        | D 0.013      | 0.001            | 0.087            |
| DEC 6,84        | NOV 6,84         | 0.003            | 0.001          | L 0.015      | L 0.027      | L 0.007      | 0.000            | L 0.017          |
| JAN 2,85        | DEC 6,84         | 0.003            | 0.001          | 0.005        | 0.017        | 0.005        | < 0.000          | 0.029            |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

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STATION NAME : WILKESPORT/CUMULATIVE PRECIP.

#04

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | COPPER<br>MG/L | CADMIUM<br>MG/L | FREE H+<br>MG/L |
|-----------------|------------------|----------------|-----------------|-----------------|
| JAN 31,84       | JAN 3,84         | *****          | *****           | 0.0794          |
| MAR 1,84        | JAN 31,84        | 0.008          | 0.0005          | U 0.0363        |
| MAR 27,84       | MAR 1,84         | 0.001          | 0.0003          | 0.0490          |
| APR 24,84       | MAR 27,84        | < 0.002        | < 0.0001        | 0.1000          |
| MAY 22,84       | APR 24,84        | 0.003          | 0.0001          | U 0.0000        |
| JUN 19,84       | MAY 22,84        | *****          | *****           | *****           |
| JUL 17,84       | JUN 19,84        | 0.001          | 0.0002          | 0.0537          |
| AUG 14,84       | JUL 17,84        | 0.006          | 0.0003          | 0.2089          |
| SEP 11,84       | AUG 14,84        | < 0.008        | 0.0001          | 0.0776          |
| OCT 9,84        | SEP 11,84        | < 0.001        | 0.0001          | B 0.0174        |
| NOV 6,84        | OCT 9,84         | 0.001          | 0.0002          | 0.1549          |
| DEC 6,84        | NOV 6,84         | L 0.004        | 0.0002          | 0.0646          |
| JAN 2,85        | DEC 6,84         | 0.001          | 0.0001          | 0.0407          |

PART IV

CENTRAL REGION

CUMULATIVE PRECIPITATION CHEMISTRY LISTINGS

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : CAMPBELLFORD/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | SAMPLING<br>START<br>HR. | END<br>HR. | SAMPLE<br>TYPE<br>01-RAIN<br>02-SNOW<br>03-COMP/04-OTHER | GAUGE<br>DEPTH(MM) | GAUGE<br>TYPE<br>00-APIOS<br>09-AES | SAMPLE<br>NUMBER | PROJECT<br>CODE<br>02-APIOS<br>03-SPECIAL | SUBPROJECT<br>CODE<br>01-MOE<br>03-AES | SAMPLER<br>EFFICI-<br>ENCY<br>(%) | COMMENTS<br>FIELD OFFICE |
|-----------------|------------------|--------------------------|------------|--|--------------------|-------------------------------------|------------------|---|--|-----------------------------------|--------------------------|
| JAN 31,84       | JAN 3,84         | 800                      | 830        | 2  | 27.5               | 0                                   | 24318            | 2   | 1                                      | 57                                |                          |
| FEB 28,84       | JAN 31,84        | 830                      | 900        | 2  | 76.0               | 0                                   | 24325            | 2   | 1                                      | 72                                |                          |
| MAR 27,84       | FEB 28,84        | 900                      | 800        | 3  | 48.7               | 0                                   | 24329            | 2   | 1                                      | 62                                |                          |
| APR 24,84       | MAR 27,84        | 830                      | 800        | 1  | 122.8              | 9                                   | 24336            | 2   | 1                                      | 0                                 | EF                       |
| MAY 22,84       | APR 24,84        | 800                      | 800        | 1  | 63.0               | 0                                   | 24343            | 2   | 1                                      | 79                                | DAF                      |
| JUN 19,84       | MAY 22,84        | 800                      | 830        | 1  | 37.0               | 0                                   | 24347            | 2   | 1                                      | 54                                |                          |
| JUL 17,84       | JUN 19,84        | 830                      | 800        | 1  | 51.0               | 0                                   | 24357            | 2   | 1                                      | 80                                | D                        |
| AUG 14,84       | JUL 17,84        | 800                      | 800        | 1  | 139.0              | 9                                   | 24375            | 2   | 1                                      | 23                                | N                        |
| SEP 11,84       | AUG 14,84        | 800                      | 1000       | 1  | 138.0              | 0                                   | 24378            | 2   | 1                                      | 61                                | AD                       |
| OCT 9,84        | SEP 11,84        | 1000                     | 800        | 1  | 33.1               | 9                                   | 24381            | 2   | 1                                      | 82                                | D N                      |
| NOV 6,84        | OCT 9,84         | 800                      | 830        | 1  | 37.0               | 0                                   | 24387            | 2   | 1                                      | 69                                | ACFB                     |
| DEC 4,84        | NOV 6,84         | 830                      | 830        | 1  | 52.0               | 0                                   | 24398            | 2   | 1                                      | 60                                | F                        |
| JAN 2,85        | DEC 4,84         | 830                      | 830        | 3  | 72.0               | 0                                   | 24404            | 2   | 1                                      | 61                                | BCD                      |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | VOLUME<br>ML | CONDUCT.<br>UMHO/CM | PH<br>LAB | TOTAL H+<br>TO PH8.3<br>MG/L | SULPHATE<br>MG/L | NITRATE<br>AS N<br>MG/L | CALCIUM<br>MG/L |
|-----------------|------------------|--------------|---------------------|-----------|------------------------------|------------------|-------------------------|-----------------|
| JAN 31,84       | JAN 3,84         | 515.0        | 42.3                | 4.09      | 0.1104                       | 2.25             | 0.99                    | 0.28            |
| FEB 28,84       | JAN 31,84        | 1788.0       | 19.5                | 4.48      | 0.0564                       | 1.40             | 0.37                    | 0.10            |
| MAR 27,84       | FEB 28,84        | 985.0        | 33.6                | 4.18      | 0.1076                       | 3.40             | 0.71                    | 0.38            |
| APR 24,84       | MAR 27,84        | 0.0          | *****               | *****     | *****                        | *****            | *****                   | *****           |
| MAY 22,84       | APR 24,84        | 1624.0       | 25.9                | 4.36      | 0.0684                       | 3.45             | 0.51                    | 0.55            |
| JUN 19,84       | MAY 22,84        | 654.0        | 45.1                | 4.11      | 0.1092                       | 5.60             | 0.68                    | 0.78            |
| JUL 17,84       | JUN 19,84        | 1333.0       | 38.3                | 4.16      | 0.0798                       | 5.55             | 0.72                    | 0.66            |
| AUG 14,84       | JUL 17,84        | 1038.0       | 44.8                | 4.11      | 0.0984                       | 4.30             | 0.77                    | 0.61            |
| SEP 11,84       | AUG 14,84        | 2754.0       | 37.5                | 4.18      | 0.0938                       | 3.75             | 0.52                    | 0.25            |
| OCT 9,84        | SEP 11,84        | 890.0        | 50.8                | 3.98      | 0.1174                       | 5.10             | 0.82                    | 0.66            |
| NOV 6,84        | OCT 9,84         | 840.0        | 19.6                | U 6.28    | 0.0246                       | 3.85             | 0.56                    | 1.04            |
| DEC 4,84        | NOV 6,84         | 1024.0       | 42.2                | 4.20      | 0.1056                       | 3.95             | 0.95                    | 0.72            |
| JAN 2,85        | DEC 4,84         | 1441.0       | 37.8                | 4.16      | *****                        | 2.95             | 0.79                    | 0.32            |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : CAMPBELLFORD/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | CHLORIDE<br>MG/L | KJELDAHL<br>AS N<br>MG/L | MAGNESIM<br>MG/L | POTASSIM<br>MG/L | SODIUM<br>MG/L | AMMONIUM<br>AS N<br>MG/L | PHOSPHOR<br>MG/L |
|-----------------|------------------|------------------|--------------------------|------------------|------------------|----------------|--------------------------|------------------|
| JAN 31,84       | JAN 3,84         | 0.45             | 0.46                     | 0.035            | <T 0.015         | 0.215          | 0.390                    | 0.015            |
| FEB 28,84       | JAN 31,84        | 0.20             | 0.20                     | 0.020            | <W 0.005         | 0.095          | 0.186                    | 0.005            |
| MAR 27,84       | FEB 28,84        | 0.32             | 0.33                     | 0.060            | <T 0.015         | 0.170          | 0.274                    | 0.011            |
| APR 24,84       | MAR 27,84        | *****            | *****                    | *****            | *****            | *****          | *****                    | *****            |
| MAY 22,84       | APR 24,84        | 0.10             | 0.69                     | 0.060            | 0.045            | 0.065          | 0.390                    | 0.034            |
| JUN 19,84       | MAY 22,84        | 0.12             | 0.88                     | 0.105            | 0.080            | 0.080          | 0.605                    | 0.025            |
| JUL 17,84       | JUN 19,84        | 0.16             | 1.16                     | 0.090            | U 0.655          | 0.035          | 0.810                    | 0.125            |
| AUG 14,84       | JUL 17,84        | 0.16             | 0.51                     | 0.130            | 0.035            | 0.035          | 0.420                    | <T 0.002         |
| SEP 11,84       | AUG 14,84        | 0.10             | 0.51                     | 0.035            | 0.050            | 0.050          | 0.445                    | 0.006            |
| OCT 9,84        | SEP 11,84        | 0.18             | 0.57                     | 0.080            | 0.030            | 0.075          | 0.490                    | <T 0.003         |
| NOV 6,84        | OCT 9,84         | 0.16             | U 1.71                   | 0.115            | U 0.360          | 0.070          | 0.945                    | U 0.115          |
| DEC 4,84        | NOV 6,84         | 0.27             | 0.67                     | 0.060            | 0.050            | 0.125          | 0.645                    | 0.010            |
| JAN 2,85        | DEC 4,84         | 0.27             | 0.47                     | 0.045            | 0.095            | 0.130          | 0.410                    | 0.009            |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | MANGANSE<br>MG/L | NICKEL<br>MG/L | ZINC<br>MG/L | IRON<br>MG/L | LEAD<br>MG/L | VANADIUM<br>MG/L | ALUMINUM<br>MG/L |
|-----------------|------------------|------------------|----------------|--------------|--------------|--------------|------------------|------------------|
| JAN 31,84       | JAN 3,84         | 0.003            | < 0.001        | 0.013        | 0.059        | 0.014        | < 0.002          | 0.071            |
| FEB 28,84       | JAN 31,84        | 0.001            | < 0.001        | 0.005        | 0.015        | 0.006        | < 0.002          | 0.025            |
| MAR 27,84       | FEB 28,84        | 0.002            | < 0.001        | 0.006        | 0.023        | 0.009        | < 0.002          | 0.034            |
| APR 24,84       | MAR 27,84        | *****            | *****          | *****        | *****        | *****        | *****            | *****            |
| MAY 22,84       | APR 24,84        | 0.006            | < 0.001        | 0.005        | 0.053        | 0.008        | < 0.002          | 0.076            |
| JUN 19,84       | MAY 22,84        | 0.007            | < 0.001        | 0.009        | 0.110        | 0.017        | < 0.002          | 0.120            |
| JUL 17,84       | JUN 19,84        | 0.004            | 0.001          | 0.008        | 0.033        | 0.012        | < 0.002          | 0.036            |
| AUG 14,84       | JUL 17,84        | 0.005            | < 0.001        | 0.008        | 0.046        | 0.009        | < 0.002          | 0.046            |
| SEP 11,84       | AUG 14,84        | 0.002            | < 0.001        | 0.009        | 0.036        | 0.007        | < 0.002          | 0.027            |
| OCT 9,84        | SEP 11,84        | 0.005            | < 0.001        | 0.007        | 0.080        | 0.006        | < 0.002          | 0.063            |
| NOV 6,84        | OCT 9,84         | 0.008            | 0.001          | 0.013        | 0.050        | 0.006        | 0.001            | 0.059            |
| DEC 4,84        | NOV 6,84         | 0.004            | 0.001          | 0.013        | 0.046        | 0.015        | 0.001            | 0.052            |
| JAN 2,85        | DEC 4,84         | 0.003            | 0.000          | 0.010        | D 0.030      | 0.013        | 0.001            | 0.028            |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

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STATION NAME : CAMPBELLFORD/CUMULATIVE PRECIP.

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PAGE : 3

| REMOVAL<br>DATE | EXPOSURE<br>DATE | COPPER<br>MG/L | CADMIUM<br>MG/L | FREE H+<br>MG/L |
|-----------------|------------------|----------------|-----------------|-----------------|
| JAN 31,84       | JAN 3,84         | < 0.003        | 0.0002          | 0.0813          |
| FEB 28,84       | JAN 31,84        | < 0.002        | < 0.0001        | 0.0331          |
| MAR 27,84       | FEB 28,84        | < 0.002        | 0.0001          | 0.0661          |
| APR 24,84       | MAR 27,84        | *****          | *****           | *****           |
| MAY 22,84       | APR 24,84        | < 0.002        | 0.0001          | 0.0437          |
| JUN 19,84       | MAY 22,84        | < 0.003        | 0.0001          | 0.0776          |
| JUL 17,84       | JUN 19,84        | < 0.002        | 0.0001          | 0.0692          |
| AUG 14,84       | JUL 17,84        | 0.002          | 0.0001          | 0.0776          |
| SEP 11,84       | AUG 14,84        | < 0.001        | 0.0001          | 0.0661          |
| OCT 9,84        | SEP 11,84        | 0.003          | 0.0001          | 0.1047          |
| NOV 6,84        | OCT 9,84         | 0.001          | 0.0001          | U 0.0005        |
| DEC 4,84        | NOV 6,84         | 0.003          | 0.0001          | 0.0631          |
| JAN 2,85        | DEC 4,84         | 0.002          | 0.0002          | 0.0692          |



ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : COLDWATER/CUMULATIVE PRECIP.

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PAGE : 1

| REMOVAL<br>DATE | EXPOSURE<br>DATE | SAMPLING<br>START<br>HR. | SAMPLING<br>END<br>HR. | SAMPLE<br>TYPE<br>01-RAIN<br>02-SNOW<br>03-COMP/04-OTHER | GAUGE<br>DEPTH(MM) | GAUGE<br>TYPE<br>00-APIOS<br>09-AES | SAMPLE<br>NUMBER | PROJECT<br>CODE<br>02-APIOS<br>03-SPECIAL | SUBPROJECT<br>CODE<br>01-MOE<br>03-AES | SAMPLER<br>EFFICI-<br>ENCY<br>(%) | COMMENTS<br>FIELD OFFICE |
|-----------------|------------------|--------------------------|------------------------|--|--------------------|-------------------------------------|------------------|---|--|-----------------------------------|--------------------------|
| JAN 31,84       | JAN 3,84         | 725                      | 730                    | 2  | 57.1               | 9                                   | 29288            | 2   | 1                                      | 35                                | N                        |
| FEB 28,84       | JAN 31,84        | 730                      | 730                    | 3  | 56.0               | 0                                   | 29296            | 2   | 1                                      | 61                                |                          |
| MAR 27,84       | FEB 28,84        | 730                      | 730                    | 3  | 67.0               | 0                                   | 29301            | 2   | 1                                      | U 64                              | G                        |
| APR 24,84       | MAR 27,84        | 730                      | 845                    | 3  | 53.0               | 0                                   | 29313            | 2   | 1                                      | U 78                              | AFI                      |
| MAY 22,84       | APR 24,84        | 845                      | 730                    | 1  | 61.8               | 9                                   | 29321            | 2   | 1                                      | 58                                | ACFIQ H                  |
| JUN 19,84       | MAY 22,84        | 730                      | 815                    | 1  | 110.0              | 0                                   | 29330            | 2   | 1                                      | U 66                              | AF                       |
| JUL 17,84       | JUN 19,84        | 815                      | 745                    | 1  | 95.8               | 9                                   | 29336            | 2   | 1                                      | 79                                | FI                       |
| AUG 14,84       | JUL 17,84        | 745                      | 745                    | 1  | 40.0               | 0                                   | 29349            | 2   | 1                                      | 82                                | A                        |
| SEP 11,84       | AUG 14,84        | 745                      | 745                    | 1  | 132.0              | 0                                   | 29358            | 2   | 1                                      | U 73                              | F                        |
| OCT 9,84        | SEP 11,84        | 745                      | 745                    | 1  | 58.0               | 0                                   | 29368            | 2   | 1                                      | U 75                              | FIJA                     |
| NOV 6,84        | OCT 9,84         | 745                      | 800                    | 3  | 65.0               | 0                                   | 29376            | 2   | 1                                      | 86                                |                          |
| DEC 4,84        | NOV 6,84         | 800                      | 800                    | 3  | 80.0               | 0                                   | 29384            | 2   | 1                                      | 75                                |                          |
| DEC 31,84       | DEC 4,84         | 800                      | 1200                   | 3  | 93.0               | 0                                   | 29396            | 2   | 1                                      | 82                                |                          |

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | VOLUME<br>ML | CONDUCT.<br>UMHO/CM | PH<br>LAB | TOTAL H+<br>TO PH8.3<br>MG/L | SULPHATE<br>MG/L | NITRATE<br>AS N<br>MG/L | CALCIUM<br>MG/L |
|-----------------|------------------|--------------|---------------------|-----------|------------------------------|------------------|-------------------------|-----------------|
| JAN 31,84       | JAN 3,84         | 658.0        | 28.1                | 4.27      | 0.0840                       | 1.20             | 0.75                    | 0.22            |
| FEB 28,84       | JAN 31,84        | 1122.0       | 22.0                | 4.44      | 0.0602                       | 1.70             | 0.45                    | 0.16            |
| MAR 27,84       | FEB 28,84        | 1413.0       | 32.8                | 4.25      | 0.0822                       | 3.00             | 0.61                    | 0.47            |
| APR 24,84       | MAR 27,84        | 1347.0       | 11.3                | U 6.20    | 0.0310                       | 1.95             | 0.27                    | 0.28            |
| MAY 22,84       | APR 24,84        | 1170.0       | 30.5                | G 4.77    | 0.0642                       | 5.90             | 0.62                    | 1.80            |
| JUN 19,84       | MAY 22,84        | 2360.0       | 29.0                | 4.45      | 0.0630                       | 3.75             | 0.54                    | 0.50            |
| JUL 17,84       | JUN 19,84        | 2485.0       | 35.6                | 4.13      | 0.0788                       | 3.85             | 0.52                    | 0.17            |
| AUG 14,84       | JUL 17,84        | 1068.0       | 38.5                | 4.19      | 0.0834                       | 4.30             | 0.37                    | 0.45            |
| SEP 11,84       | AUG 14,84        | 3162.0       | 27.0                | 4.27      | D 0.0716                     | 2.70             | 0.35                    | 0.18            |
| OCT 9,84        | SEP 11,84        | 1423.0       | 38.8                | 4.20      | D 0.0920                     | 4.00             | 0.55                    | 0.33            |
| NOV 6,84        | OCT 9,84         | 1834.0       | 37.1                | 4.21      | 0.0942                       | 3.35             | 0.57                    | 0.34            |
| DEC 4,84        | NOV 6,84         | 1950.0       | 26.9                | 4.40      | 0.0692                       | 2.25             | 0.53                    | 0.24            |
| DEC 31,84       | DEC 4,84         | 2502.0       | 20.0                | 4.50      | *****                        | 1.65             | 0.36                    | 0.16            |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : COLDWATER/CUMULATIVE PRECIP.

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PAGE : 2

| REMOVAL<br>DATE | EXPOSURE<br>DATE | CHLORIDE<br>MG/L | KJELDAHL<br>AS N<br>MG/L | MAGNESIM<br>MG/L | POTASSIM<br>MG/L | SODIUM<br>MG/L | AMMONIUM<br>AS N<br>MG/L | PHOSPHOR<br>MG/L |
|-----------------|------------------|------------------|--------------------------|------------------|------------------|----------------|--------------------------|------------------|
| JAN 31,84       | JAN 3,84         | 0.38             | 0.48                     | 0.030            | 0.025            | 0.235          | 0.140                    | 0.027            |
| FEB 28,84       | JAN 31,84        | 0.20             | 0.26                     | 0.025            | <T 0.050         | 0.140          | 0.220                    | 0.009            |
| MAR 27,84       | FEB 28,84        | 0.25             | 0.34                     | 0.070            | 0.030            | 0.140          | 0.246                    | 0.015            |
| APR 24,84       | MAR 27,84        | 0.50             | G 1.21                   | 0.040            | G 0.275          | 0.115          | 0.800                    | U 0.140          |
| MAY 22,84       | APR 24,84        | 0.33             | 1.07                     | 0.275            | 0.170            | 0.160          | 0.835                    | 0.050            |
| JUN 19,84       | MAY 22,84        | 0.13             | 0.70                     | 0.100            | 0.050            | 0.065          | 0.595                    | <T 0.004         |
| JUL 17,84       | JUN 19,84        | 0.16             | 0.60                     | 0.030            | 0.025            | <T 0.005       | 0.495                    | 0.012            |
| AUG 14,84       | JUL 17,84        | 0.15             | 0.67                     | 0.090            | 0.065            | 0.060          | 0.580                    | <W 0.001         |
| SEP 11,84       | AUG 14,84        | 0.11             | 0.30                     | 0.025            | 0.035            | 0.035          | 0.255                    | 0.005            |
| OCT 9,84        | SEP 11,84        | 0.13             | 0.47                     | 0.060            | 0.055            | <T 0.015       | 0.435                    | <T 0.003         |
| NOV 6,84        | OCT 9,84         | 0.17             | 0.37                     | 0.050            | <T 0.015         | 0.040          | 0.315                    | <T 0.004         |
| DEC 4,84        | NOV 6,84         | 0.16             | 0.39                     | 0.020            | <W 0.005         | 0.030          | 0.360                    | <T 0.003         |
| DEC 31,84       | DEC 4,84         | 0.18             | 0.25                     | <T 0.015         | <T 0.015         | 0.080          | 0.190                    | 0.013            |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | MANGANSE<br>MG/L | NICKEL<br>MG/L | ZINC<br>MG/L | IRON<br>MG/L | LEAD<br>MG/L | VANADIUM<br>MG/L | ALUMINUM<br>MG/L |
|-----------------|------------------|------------------|----------------|--------------|--------------|--------------|------------------|------------------|
| JAN 31,84       | JAN 3,84         | 0.002            | < 0.001        | 0.006        | 0.044        | 0.006        | < 0.002          | 0.030            |
| FEB 28,84       | JAN 31,84        | 0.001            | < 0.001        | 0.005        | 0.021        | 0.006        | < 0.002          | 0.036            |
| MAR 27,84       | FEB 28,84        | 0.004            | < 0.001        | 0.006        | 0.044        | 0.007        | < 0.002          | 0.042            |
| APR 24,84       | MAR 27,84        | 0.002            | < 0.001        | 0.004        | 0.013        | 0.003        | < 0.002          | 0.020            |
| MAY 22,84       | APR 24,84        | U 0.022          | < 0.001        | D 0.011      | 0.235        | 0.010        | < 0.002          | U 0.292          |
| JUN 19,84       | MAY 22,84        | 0.007            | < 0.001        | 0.006        | 0.120        | 0.009        | < 0.002          | 0.126            |
| JUL 17,84       | JUN 19,84        | 0.002            | < 0.001        | 0.003        | 0.021        | 0.006        | < 0.002          | 0.025            |
| AUG 14,84       | JUL 17,84        | 0.004            | < 0.001        | 0.004        | 0.038        | 0.007        | < 0.002          | 0.025            |
| SEP 11,84       | AUG 14,84        | 0.002            | < 0.001        | 0.004        | 0.021        | 0.006        | < 0.002          | 0.034            |
| OCT 9,84        | SEP 11,84        | 0.003            | < 0.001        | 0.007        | 0.027        | 0.007        | < 0.002          | 0.035            |
| NOV 6,84        | OCT 9,84         | 0.002            | < 0.001        | 0.005        | 0.037        | 0.007        | < 0.002          | 0.039            |
| DEC 4,84        | NOV 6,84         | 0.003            | 0.000          | 0.007        | 0.051        | 0.009        | < 0.000          | 0.045            |
| DEC 31,84       | DEC 4,84         | 0.002            | 0.000          | 0.004        | 0.023        | 0.004        | < 0.000          | 0.027            |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

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STATION NAME : COLDWATER/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | COPPER<br>MG/L | CADMIUM<br>MG/L | FREE H+<br>MG/L |
|-----------------|------------------|----------------|-----------------|-----------------|
| JAN 31,84       | JAN 3,84         | < 0.003        | < 0.0001        | 0.0537          |
| FEB 28,84       | JAN 31,84        | 0.001          | 0.0001          | 0.0363          |
| MAR 27,84       | FEB 28,84        | < 0.002        | < 0.0001        | 0.0562          |
| APR 24,84       | MAR 27,84        | 0.002          | < 0.0001        | U 0.0006        |
| MAY 22,84       | APR 24,84        | 0.002          | 0.0001          | G 0.0170        |
| JUN 19,84       | MAY 22,84        | 0.003          | 0.0001          | 0.0355          |
| JUL 17,84       | JUN 19,84        | < 0.001        | 0.0001          | 0.0741          |
| AUG 14,84       | JUL 17,84        | 0.001          | 0.0002          | 0.0646          |
| SEP 11,84       | AUG 14,84        | < 0.001        | < 0.0001        | 0.0537          |
| OCT 9,84        | SEP 11,84        | < 0.002        | 0.0001          | 0.0631          |
| NOV 6,84        | OCT 9,84         | 0.001          | 0.0001          | 0.0617          |
| DEC 4,84        | NOV 6,84         | 0.001          | 0.0001          | 0.0398          |
| DEC 31,84       | DEC 4,84         | 0.000          | 0.0000          | 0.0316          |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : DORSET/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | SAMPLING<br>START<br>HR. | END<br>HR. | SAMPLE<br>TYPE<br>01-RAIN<br>02-SNOW<br>03-COMP/04-OTHER | GAUGE<br>DEPTH(MM) | GAUGE<br>TYPE<br>00-APIOS<br>09-AES | SAMPLE<br>NUMBER | PROJECT<br>CODE<br>02-APIOS<br>03-SPECIAL | SUBPROJECT<br>CODE<br>01-MOE<br>03-AES | SAMPLER<br>EFFICI-<br>ENCY<br>(%) | COMMENTS<br>FIELD OFFICE |
|-----------------|------------------|--------------------------|------------|--|--------------------|-------------------------------------|------------------|---|--|-----------------------------------|--------------------------|
| JAN 31,84       | JAN 3,84         | 1500                     | 900        | 2  | 47.0               | 0                                   | 29280            | 2   | 1                                      | 70                                |                          |
| FEB 28,84       | JAN 31,84        | 915                      | 855        | 3  | 69.0               | 0                                   | 29290            | 2   | 1                                      | 86                                | A                        |
| MAR 27,84       | FEB 28,84        | 855                      | 1030       | 3  | 62.0               | 0                                   | 29298            | 2   | 1                                      | 84                                |                          |
| APR 24,84       | MAR 27,84        | 1030                     | 1110       | 3  | 50.0               | 0                                   | 29310            | 2   | 1                                      | 87                                |                          |
| MAY 22,84       | APR 24,84        | 1110                     | 1110       | 1  | 54.0               | 0                                   | 29318            | 2   | 1                                      | 94                                | C                        |
| JUN 19,84       | MAY 22,84        | 1110                     | 920        | 1  | 107.0              | 0                                   | 29327            | 2   | 1                                      | 92                                | A                        |
| JUL 17,84       | JUN 19,84        | 920                      | 1100       | 1  | 89.0               | 0                                   | 29333            | 2   | 1                                      | 91                                |                          |
| AUG 14,84       | JUL 17,84        | 1100                     | 900        | 1  | 37.0               | 0                                   | 29346            | 2   | 1                                      | 84                                |                          |
| SEP 11,84       | AUG 14,84        | 900                      | 845        | 1  | 86.0               | 0                                   | 29352            | 2   | 1                                      | 92                                |                          |
| OCT 9,84        | SEP 11,84        | 845                      | 900        | 1  | 56.0               | 0                                   | 29363            | 2   | 1                                      | 88                                |                          |
| NOV 6,84        | OCT 9,84         | 900                      | 900        | 3  | 76.0               | 0                                   | 29373            | 2   | 1                                      | 91                                | AQ                       |
| DEC 4,84        | NOV 6,84         | 900                      | 930        | 3  | 70.0               | 0                                   | 29381            | 2   | 1                                      | 106                               | A                        |
| JAN 2,85        | DEC 4,84         | 930                      | 945        | 3  | 158.0              | 0                                   | 29391            | 2   | 1                                      | 73                                |                          |

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | VOLUME<br>ML | CONDUCT.<br>UMHO/CM | PH<br>LAB | TOTAL H+<br>TO PH8.3<br>MG/L | SULPHATE<br>MG/L | NITRATE<br>AS N<br>MG/L | CALCIUM<br>MG/L |
|-----------------|------------------|--------------|---------------------|-----------|------------------------------|------------------|-------------------------|-----------------|
| JAN 31,84       | JAN 3,84         | 1080.0       | 36.4                | 4.11      | 0.1070                       | 1.60             | 0.97                    | 0.10            |
| FEB 28,84       | JAN 31,84        | 1949.0       | 33.0                | 4.17      | 0.0958                       | 2.35             | 0.68                    | 0.07            |
| MAR 27,84       | FEB 28,84        | 1705.0       | 29.5                | 4.25      | 0.0822                       | 2.25             | 0.50                    | 0.13            |
| APR 24,84       | MAR 27,84        | 1417.0       | 17.5                | 4.50      | 0.0592                       | 1.30             | 0.26                    | 0.07            |
| MAY 22,84       | APR 24,84        | 1664.0       | 40.5                | 4.29      | 0.0894                       | 5.00             | 0.78                    | 0.80            |
| JUN 19,84       | MAY 22,84        | 3230.0       | 27.6                | 4.38      | 0.0636                       | 3.45             | 0.46                    | 0.25            |
| JUL 17,84       | JUN 19,84        | 2640.0       | 33.3                | 4.16      | 0.0970                       | 3.40             | 0.36                    | 0.15            |
| AUG 14,84       | JUL 17,84        | 1012.0       | 30.5                | 4.22      | 0.0848                       | 3.20             | 0.29                    | 0.21            |
| SEP 11,84       | AUG 14,84        | 2577.0       | 26.4                | 4.36      | 0.0710                       | 2.60             | 0.31                    | D 0.20          |
| OCT 9,84        | SEP 11,84        | 1609.0       | 40.4                | 4.14      | 0.0982                       | 3.60             | 0.57                    | 0.22            |
| NOV 6,84        | OCT 9,84         | 2257.0       | 34.9                | 4.21      | 0.0894                       | 2.95             | 0.49                    | 0.17            |
| DEC 4,84        | NOV 6,84         | 2416.0       | 22.8                | 4.39      | 0.0628                       | 1.70             | 0.40                    | 0.21            |
| JAN 2,85        | DEC 4,84         | 3750.0       | 17.7                | 4.52      | 0.0524                       | 1.30             | 0.30                    | <T 0.04         |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : DORSET/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | CHLORIDE<br>MG/L | KJELDAHL<br>AS N<br>MG/L | MAGNESIM<br>MG/L | POTASSIM<br>MG/L | SODIUM<br>MG/L | AMMONIUM<br>AS N<br>MG/L | PHOSPHOR<br>MG/L |
|-----------------|------------------|------------------|--------------------------|------------------|------------------|----------------|--------------------------|------------------|
| JAN 31,84       | JAN 3,84         | 0.21             | 0.42                     | 0.020            | 0.020            | 0.065          | 0.340                    | <T 0.003         |
| FEB 28,84       | JAN 31,84        | 0.17             | 0.36                     | <T 0.005         | <T 0.015         | 0.090          | 0.310                    | 0.008            |
| MAR 27,84       | FEB 28,84        | 0.15             | 0.21                     | 0.020            | <W 0.005         | 0.035          | 0.138                    | 0.007            |
| APR 24,84       | MAR 27,84        | 0.05             | 0.15                     | 0.015            | <T 0.015         | 0.040          | 0.080                    | 0.013            |
| MAY 22,84       | APR 24,84        | 0.21             | 0.88                     | 0.145            | 0.080            | 0.080          | 0.620                    | 0.038            |
| JUN 19,84       | MAY 22,84        | 0.12             | 0.75                     | 0.055            | 0.060            | 0.060          | 0.595                    | 0.016            |
| JUL 17,84       | JUN 19,84        | 0.10             | 0.38                     | 0.020            | <T 0.010         | <W 0.005       | 0.280                    | <T 0.003         |
| AUG 14,84       | JUL 17,84        | 0.09             | 0.36                     | 0.040            | <T 0.010         | 0.020          | 0.255                    | <T 0.003         |
| SEP 11,84       | AUG 14,84        | 0.08             | 0.25                     | 0.030            | <W 0.005         | 0.020          | 0.215                    | <T 0.003         |
| OCT 9,84        | SEP 11,84        | 0.11             | 0.39                     | 0.035            | 0.040            | 0.020          | 0.375                    | <W 0.001         |
| NOV 6,84        | OCT 9,84         | 0.12             | 0.33                     | 0.030            | <T 0.015         | 0.040          | 0.285                    | <T 0.003         |
| DEC 4,84        | NOV 6,84         | 0.13             | 0.27                     | 0.015            | <W 0.005         | 0.030          | 0.230                    | 0.007            |
| JAN 2,85        | DEC 4,84         | 0.10             | 0.18                     | <T 0.015         | 0.035            | 0.030          | 0.150                    | <T 0.003         |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | MANGANSE<br>MG/L | NICKEL<br>MG/L | ZINC<br>MG/L | IRON<br>MG/L | LEAD<br>MG/L | VANADIUM<br>MG/L | ALUMINUM<br>MG/L |
|-----------------|------------------|------------------|----------------|--------------|--------------|--------------|------------------|------------------|
| JAN 31,84       | JAN 3,84         | 0.002            | U 0.026        | 0.007        | 0.027        | 0.008        | < 0.002          | 0.022            |
| FEB 28,84       | JAN 31,84        | 0.001            | < 0.001        | 0.006        | 0.017        | 0.006        | < 0.002          | 0.023            |
| MAR 27,84       | FEB 28,84        | 0.001            | < 0.001        | 0.004        | 0.031        | 0.005        | < 0.002          | 0.035            |
| APR 24,84       | MAR 27,84        | < 0.001          | < 0.001        | < 0.003      | 0.012        | 0.002        | < 0.002          | 0.019            |
| MAY 22,84       | APR 24,84        | G 0.014          | < 0.001        | 0.006        | 0.151        | 0.006        | < 0.002          | 0.229            |
| JUN 19,84       | MAY 22,84        | 0.004            | < 0.001        | 0.003        | 0.044        | 0.010        | < 0.002          | 0.053            |
| JUL 17,84       | JUN 19,84        | 0.002            | < 0.001        | 0.002        | 0.019        | 0.006        | < 0.002          | 0.019            |
| AUG 14,84       | JUL 17,84        | 0.002            | < 0.001        | 0.005        | 0.026        | 0.002        | < 0.002          | 0.036            |
| SEP 11,84       | AUG 14,84        | 0.002            | < 0.001        | 0.004        | 0.023        | 0.007        | < 0.002          | 0.031            |
| OCT 9,84        | SEP 11,84        | 0.002            | < 0.001        | 0.006        | 0.019        | 0.006        | < 0.002          | 0.030            |
| NOV 6,84        | OCT 9,84         | 0.001            | < 0.001        | 0.002        | 0.007        | 0.006        | < 0.002          | 0.013            |
| DEC 4,84        | NOV 6,84         | 0.001            | 0.000          | 0.003        | 0.013        | 0.004        | < 0.000          | 0.013            |
| JAN 2,85        | DEC 4,84         | < 0.001          | 0.000          | 0.002        | 0.011        | 0.002        | < 0.000          | 0.011            |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

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STATION NAME : DORSET/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | COPPER<br>MG/L | CADMIUM<br>MG/L | FREE H+<br>MG/L |
|-----------------|------------------|----------------|-----------------|-----------------|
| JAN 31,84       | JAN 3,84         | < 0.002        | < 0.0001        | 0.0776          |
| FEB 28,84       | JAN 31,84        | < 0.002        | 0.0001          | 0.0676          |
| MAR 27,84       | FEB 28,84        | < 0.002        | < 0.0001        | 0.0562          |
| APR 24,84       | MAR 27,84        | < 0.002        | < 0.0001        | 0.0316          |
| MAY 22,84       | APR 24,84        | < 0.002        | 0.0001          | 0.0513          |
| JUN 19,84       | MAY 22,84        | 0.001          | < 0.0001        | 0.0417          |
| JUL 17,84       | JUN 19,84        | < 0.001        | 0.0001          | 0.0692          |
| AUG 14,84       | JUL 17,84        | < 0.002        | 0.0002          | 0.0603          |
| SEP 11,84       | AUG 14,84        | < 0.001        | < 0.0001        | 0.0437          |
| OCT 9,84        | SEP 11,84        | < 0.002        | 0.0001          | 0.0724          |
| NOV 6,84        | OCT 9,84         | < 0.001        | 0.0001          | 0.0617          |
| DEC 4,84        | NOV 6,84         | 0.001          | 0.0001          | 0.0407          |
| JAN 2,85        | DEC 4,84         | 0.000          | < 0.0000        | 0.0302          |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : MILTON/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | SAMPLING<br>START<br>HR. | SAMPLING<br>END<br>HR. | SAMPLE<br>TYPE<br>01-RAIN<br>02-SNOW<br>03-COMP/04-OTHER | GAUGE<br>DEPTH(MM) | GAUGE<br>TYPE<br>00-APIOS<br>09-AES | SAMPLE<br>NUMBER | PROJECT<br>CODE<br>02-APIOS<br>03-SPECIAL | SUBPROJECT<br>CODE<br>01-MOE<br>03-AES | SAMPLER<br>EFFICI-<br>ENCY<br>(%) | COMMENTS<br>FIELD OFFICE |
|-----------------|------------------|--------------------------|------------------------|--|--------------------|-------------------------------------|------------------|---|--|-----------------------------------|--------------------------|
| JAN 31,84       | JAN 3,84         | 1245                     | 1000                   | 2  | 31.7               | 9                                   | 40126            | 2   | 1                                      | 79                                | G                        |
| FEB 28,84       | JAN 31,84        | 1000                     | 930                    | 2  | 69.1               | 9                                   | 40133            | 2   | 1                                      | 59                                | FJ                       |
| MAR 27,84       | FEB 28,84        | 930                      | 1015                   | 3  | 69.6               | 9                                   | 40149            | 2   | 1                                      | 71                                | JG                       |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | VOLUME<br>ML | CONDUCT.<br>UMHO/CM | PH<br>LAB | TOTAL H+<br>TO PH8.3<br>MG/L | SULPHATE<br>MG/L | NITRATE<br>AS N<br>MG/L | CALCIUM<br>MG/L |
|-----------------|------------------|--------------|---------------------|-----------|------------------------------|------------------|-------------------------|-----------------|
| JAN 31,84       | JAN 3,84         | 820.0        | 30.1                | 4.50      | 0.0652                       | 1.55             | 0.75                    | 0.53            |
| FEB 28,84       | JAN 31,84        | 1340.0       | *****               | 4.42      | D 0.0680                     | 3.00             | 0.72                    | 0.73            |
| MAR 27,84       | FEB 28,84        | 1606.0       | 36.8                | U 7.59    | 0.0192                       | 5.50             | 0.68                    | U 4.40          |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

---

STATION NAME : MILTON/CUMULATIVE PRECIP.

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PAGE : 2

| REMOVAL<br>DATE | EXPOSURE<br>DATE | CHLORIDE<br>MG/L | KJELDAHL<br>AS N<br>MG/L | MAGNESIM<br>MG/L | POTASSIM<br>MG/L | SODIUM<br>MG/L | AMMONIUM<br>AS N<br>MG/L | PHOSPHOR<br>MG/L |
|-----------------|------------------|------------------|--------------------------|------------------|------------------|----------------|--------------------------|------------------|
| JAN 31,84       | JAN 3,84         | U 1.84           | 0.30                     | 0.140            | <T 0.005         | U 1.000        | 0.254                    | 0.016            |
| FEB 28,84       | JAN 31,84        | 0.66             | 0.35                     | 0.195            | 0.010            | 0.460          | 0.312                    | 0.012            |
| MAR 27,84       | FEB 28,84        | U 1.67           | 0.42                     | U 1.420          | 0.030            | U 0.915        | 0.116                    | 0.019            |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | MANGANSE<br>MG/L | NICKEL<br>MG/L | ZINC<br>MG/L | IRON<br>MG/L | LEAD<br>MG/L | VANADIUM<br>MG/L | ALUMINUM<br>MG/L |
|-----------------|------------------|------------------|----------------|--------------|--------------|--------------|------------------|------------------|
| JAN 31,84       | JAN 3,84         | 0.006            | < 0.001        | 0.015        | 0.073        | 0.017        | < 0.002          | 0.051            |
| FEB 28,84       | JAN 31,84        | 0.006            | 0.002          | 0.017        | 0.077        | 0.014        | 0.002            | 0.051            |
| MAR 27,84       | FEB 28,84        | U 0.026          | < 0.001        | 0.018        | 0.121        | 0.010        | < 0.002          | 0.091            |



ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

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STATION NAME : MILTON/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | COPPER<br>MG/L | CADMIUM<br>MG/L | FREE H+<br>MG/L |
|-----------------|------------------|----------------|-----------------|-----------------|
| JAN 31,84       | JAN 3,84         | G 0.012        | < 0.0001        | 0.0316          |
| FEB 28,84       | JAN 31,84        | < 0.002        | 0.0001          | 0.0380          |
| MAR 27,84       | FEB 28,84        | < 0.002        | 0.0001          | U 0.0000        |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : UXBRIDGE/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | SAMPLING<br>START<br>HR. | END<br>HR. | SAMPLE<br>TYPE<br>01-RAIN<br>02-SNOW<br>03-COMP/04-OTHER | GAUGE<br>DEPTH(MM) | GAUGE<br>TYPE<br>00-APIOS<br>09-AES | SAMPLE<br>NUMBER | PROJECT<br>CODE<br>02-APIOS<br>03-SPECIAL | SUBPROJECT<br>CODE<br>01-MOE<br>03-AES | SAMPLER<br>EFFICI-<br>ENCY<br>(%) | COMMENTS<br>FIELD OFFICE |
|-----------------|------------------|--------------------------|------------|--|--------------------|-------------------------------------|------------------|---|--|-----------------------------------|--------------------------|
| JAN 31,84       | JAN 2,84         | 1700                     | 1100       | 2  | 36.2               | 9                                   | 40127            | 2   | 1                                      | 70                                | J                        |
| FEB 27,84       | JAN 31,84        | 1100                     | 1730       | 3  | 55.7               | 9                                   | 40134            | 2   | 1                                      | 57                                |                          |
| MAR 26,84       | FEB 27,84        | 1730                     | 1730       | 3  | 76.0               | 0                                   | 40150            | 2   | 1                                      | 88                                |                          |
| APR 24,84       | MAR 26,84        | 1730                     | 945        | 1  | 87.0               | 0                                   | 40156            | 2   | 1                                      | 64                                | C                        |
| MAY 22,84       | APR 24,84        | 945                      | 1030       | 1  | 66.2               | 9                                   | 40161            | 2   | 1                                      | 83                                |                          |
| JUN 19,84       | MAY 22,84        | 1030                     | 1100       | 1  | 72.0               | 0                                   | 40193            | 2   | 1                                      | 57                                |                          |
| JUL 17,84       | JUN 19,84        | 1100                     | 1000       | 1  | 48.0               | 0                                   | 40218            | 2   | 1                                      | 40                                | AC N                     |
| AUG 14,84       | JUL 17,84        | 1000                     | 1430       | 1  | 35.0               | 0                                   | 40222            | 2   | 1                                      | 75                                |                          |
| SEP 11,84       | AUG 14,84        | 1430                     | 1130       | 1  | 125.0              | 0                                   | 40223            | 2   | 1                                      | 94                                | C                        |
| OCT 9,84        | SEP 11,84        | 1130                     | 1030       | 1  | 40.0               | 0                                   | 40227            | 2   | 1                                      | 79                                |                          |
| NOV 5,84        | OCT 9,84         | 1030                     | 1100       | 1  | 35.0               | 0                                   | 40229            | 2   | 1                                      | U 0                               | EK                       |
| DEC 4,84        | NOV 5,84         | 1100                     | 1030       | 3  | 60.2               | 9                                   | 40232            | 2   | 1                                      | 62                                | C N                      |
| JAN 2,85        | DEC 4,84         | 1030                     | 1130       | 3  | 93.0               | 0                                   | 40240            | 2   | 1                                      | U 0                               | G                        |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | VOLUME<br>ML | CONDUCT.<br>UMHO/CM | PH<br>LAB | TOTAL H+<br>TO PH8.3<br>MG/L | SULPHATE<br>MG/L | NITRATE<br>AS N<br>MG/L | CALCIUM<br>MG/L |
|-----------------|------------------|--------------|---------------------|-----------|------------------------------|------------------|-------------------------|-----------------|
| JAN 31,84       | JAN 2,84         | 827.0        | 35.6                | 4.18      | 0.0998                       | 1.55             | 0.90                    | 0.23            |
| FEB 27,84       | JAN 31,84        | 1040.0       | 26.1                | 4.30      | 0.0778                       | 1.75             | 0.60                    | 0.17            |
| MAR 26,84       | FEB 27,84        | 2185.0       | 28.8                | 4.38      | 0.0746                       | 2.40             | 0.49                    | 0.52            |
| APR 24,84       | MAR 26,84        | 1826.0       | 30.5                | 4.28      | 0.0834                       | 2.70             | 0.42                    | 0.16            |
| MAY 22,84       | APR 24,84        | 1792.0       | 32.4                | 4.39      | 0.0730                       | 4.00             | 0.72                    | 0.66            |
| JUN 19,84       | MAY 22,84        | 1353.0       | 20.0                | 4.68      | 0.0484                       | 3.00             | 0.49                    | 0.69            |
| JUL 17,84       | JUN 19,84        | 635.0        | 24.3                | U 5.71    | D 0.0228                     | 4.90             | 0.82                    | 1.89            |
| AUG 14,84       | JUL 17,84        | 863.0        | 34.7                | 4.41      | 0.0702                       | 4.65             | 0.69                    | 1.19            |
| SEP 11,84       | AUG 14,84        | 3827.0       | 38.7                | 4.18      | 0.0946                       | 3.55             | 0.52                    | 0.25            |
| OCT 9,84        | SEP 11,84        | 1030.0       | 49.5                | 4.07      | 0.1166                       | 4.55             | 0.72                    | 0.78            |
| NOV 5,84        | OCT 9,84         | 0.0          | *****               | *****     | *****                        | *****            | *****                   | *****           |
| DEC 4,84        | NOV 5,84         | 1230.0       | 34.7                | 4.25      | 0.0848                       | 3.05             | 0.60                    | 0.39            |
| JAN 2,85        | DEC 4,84         | 0.0          | *****               | *****     | *****                        | *****            | *****                   | *****           |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : UXBRIDGE/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | CHLORIDE<br>MG/L | KJELDAHL<br>AS N<br>MG/L | MAGNESIM<br>MG/L | POTASSIM<br>MG/L | SODIUM<br>MG/L | AMMONIUM<br>AS N<br>MG/L | PHOSPHOR<br>MG/L |
|-----------------|------------------|------------------|--------------------------|------------------|------------------|----------------|--------------------------|------------------|
| JAN 31,84       | JAN 2,84         | G 0.53           | 0.36                     | 0.035            | <T 0.015         | 0.270          | 0.270                    | 0.021            |
| FEB 27,84       | JAN 31,84        | 0.24             | 0.24                     | 0.025            | <T 0.010         | 0.105          | 0.180                    | 0.005            |
| MAR 26,84       | FEB 27,84        | 0.30             | D 0.14                   | 0.050            | <T 0.005         | 0.130          | 0.080                    | 0.007            |
| APR 24,84       | MAR 26,84        | 0.12             | 0.28                     | 0.015            | 0.065            | 0.070          | 0.175                    | 0.018            |
| MAY 22,84       | APR 24,84        | 0.14             | 0.81                     | 0.085            | 0.035            | 0.030          | 0.745                    | <T 0.002         |
| JUN 19,84       | MAY 22,84        | 0.11             | 0.58                     | 0.095            | 0.045            | 0.050          | 0.470                    | 0.008            |
| JUL 17,84       | JUN 19,84        | 0.33             | 1.04                     | 0.190            | 0.100            | 0.060          | 0.775                    | 0.030            |
| AUG 14,84       | JUL 17,84        | 0.27             | 0.45                     | 0.260            | 0.055            | 0.100          | 0.315                    | 0.007            |
| SEP 11,84       | AUG 14,84        | 0.14             | 0.41                     | 0.040            | <T 0.010         | 0.025          | 0.325                    | <T 0.003         |
| OCT 9,84        | SEP 11,84        | 0.17             | 0.59                     | 0.115            | 0.085            | 0.040          | 0.520                    | 0.008            |
| NOV 5,84        | OCT 9,84         | *****            | *****                    | *****            | *****            | *****          | *****                    | *****            |
| DEC 4,84        | NOV 5,84         | 0.24             | 0.46                     | 0.035            | 0.020            | 0.050          | 0.390                    | 0.005            |
| JAN 2,85        | DEC 4,84         | *****            | *****                    | *****            | *****            | *****          | *****                    | *****            |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | MANGANSE<br>MG/L | NICKEL<br>MG/L | ZINC<br>MG/L | IRON<br>MG/L | LEAD<br>MG/L | VANADIUM<br>MG/L | ALUMINUM<br>MG/L |
|-----------------|------------------|------------------|----------------|--------------|--------------|--------------|------------------|------------------|
| JAN 31,84       | JAN 2,84         | 0.002            | 0.002          | 0.012        | 0.046        | 0.008        | < 0.002          | 0.041            |
| FEB 27,84       | JAN 31,84        | 0.002            | < 0.001        | 0.006        | 0.030        | 0.007        | < 0.002          | 0.047            |
| MAR 26,84       | FEB 27,84        | 0.003            | < 0.001        | 0.007        | 0.054        | 0.005        | < 0.002          | 0.036            |
| APR 24,84       | MAR 26,84        | 0.001            | < 0.001        | 0.004        | 0.013        | 0.005        | < 0.002          | 0.018            |
| MAY 22,84       | APR 24,84        | 0.006            | < 0.001        | 0.005        | 0.099        | 0.008        | < 0.002          | 0.095            |
| JUN 19,84       | MAY 22,84        | 0.004            | < 0.001        | 0.006        | 0.070        | 0.008        | < 0.002          | 0.082            |
| JUL 17,84       | JUN 19,84        | 0.009            | < 0.001        | 0.019        | 0.133        | U 0.023      | < 0.002          | 0.086            |
| AUG 14,84       | JUL 17,84        | 0.008            | < 0.001        | 0.020        | 0.077        | U 0.029      | < 0.002          | 0.076            |
| SEP 11,84       | AUG 14,84        | 0.002            | < 0.001        | 0.003        | 0.023        | 0.007        | < 0.002          | 0.049            |
| OCT 9,84        | SEP 11,84        | 0.005            | < 0.001        | 0.007        | 0.055        | 0.006        | < 0.002          | 0.069            |
| NOV 5,84        | OCT 9,84         | *****            | *****          | *****        | *****        | *****        | *****            | *****            |
| DEC 4,84        | NOV 5,84         | 0.003            | 0.000          | 0.006        | 0.041        | 0.010        | 0.000            | U 0.179          |
| JAN 2,85        | DEC 4,84         | *****            | *****          | *****        | *****        | *****        | *****            | *****            |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

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STATION NAME : UXBRIDGE/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | COPPER<br>MG/L | CADMIUM<br>MG/L | FREE H+<br>MG/L |
|-----------------|------------------|----------------|-----------------|-----------------|
| JAN 31,84       | JAN 2,84         | 0.004          | 0.0001          | 0.0661          |
| FEB 27,84       | JAN 31,84        | 0.004          | 0.0001          | 0.0501          |
| MAR 26,84       | FEB 27,84        | < 0.001        | 0.0003          | 0.0417          |
| APR 24,84       | MAR 26,84        | < 0.002        | 0.0001          | 0.0525          |
| MAY 22,84       | APR 24,84        | < 0.002        | 0.0001          | 0.0407          |
| JUN 19,84       | MAY 22,84        | < 0.002        | 0.0001          | 0.0209          |
| JUL 17,84       | JUN 19,84        | 0.004          | 0.0002          | U 0.0019        |
| AUG 14,84       | JUL 17,84        | 0.004          | 0.0002          | 0.0389          |
| SEP 11,84       | AUG 14,84        | < 0.001        | < 0.0001        | 0.0661          |
| OCT 9,84        | SEP 11,84        | < 0.002        | 0.0001          | 0.0851          |
| NOV 5,84        | OCT 9,84         | *****          | *****           | *****           |
| DEC 4,84        | NOV 5,84         | 0.001          | 0.0001          | 0.0562          |
| JAN 2,85        | DEC 4,84         | *****          | *****           | *****           |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : WILBERFORCE/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | SAMPLING<br>START<br>HR. | END<br>HR. | SAMPLE<br>TYPE<br>01-RAIN<br>02-SNOW<br>03-COMP/04-OTHER | GAUGE<br>DEPTH(MM) | GAUGE<br>TYPE<br>00-APIOS<br>09-AES | SAMPLE<br>NUMBER | PROJECT<br>CODE<br>02-APIOS<br>03-SPECIAL | SUBPROJECT<br>CODE<br>01-MOE<br>03-AES | SAMPLER<br>EFFICI-<br>ENCY<br>(%) | COMMENTS<br>FIELD OFFICE |
|-----------------|------------------|--------------------------|------------|--|--------------------|-------------------------------------|------------------|---|--|-----------------------------------|--------------------------|
| JAN 31,84       | JAN 3,84         | 930                      | 1000       | 2  | 34.0               | 0                                   | 29286            | 2   | 1                                      | 70                                |                          |
| FEB 28,84       | JAN 31,84        | 1000                     | 700        | 3  | 92.0               | 0                                   | 29295            | 2   | 1                                      | 70                                |                          |
| MAR 27,84       | FEB 28,84        | 700                      | 830        | 3  | 63.0               | 0                                   | 29302            | 2   | 1                                      | 71                                |                          |
| APR 24,84       | MAR 27,84        | 830                      | 700        | 3  | 81.0               | 0                                   | 29314            | 2   | 1                                      | 75                                |                          |
| MAY 22,84       | APR 24,84        | 700                      | 1000       | 1  | 70.0               | 0                                   | 29323            | 2   | 1                                      | U 84                              | QFJC                     |
| JUN 19,84       | MAY 22,84        | 1000                     | 800        | 1  | 50.0               | 0                                   | 29332            | 2   | 1                                      | 86                                | C                        |
| JUL 17,84       | JUN 19,84        | 800                      | 830        | 1  | 114.0              | 0                                   | 29337            | 2   | 1                                      | 64                                |                          |
| AUG 14,84       | JUL 17,84        | 830                      | 1030       | 1  | 71.0               | 0                                   | 29350            | 2   | 1                                      | U 87                              | GQ                       |
| SEP 11,84       | AUG 14,84        | 1030                     | 1030       | 1  | 83.0               | 0                                   | 29357            | 2   | 1                                      | 87                                |                          |
| OCT 9,84        | SEP 11,84        | 1030                     | 900        | 1  | 51.0               | 0                                   | 29371            | 2   | 1                                      | 85                                | A                        |
| NOV 6,84        | OCT 9,84         | 900                      | 1230       | 3  | 72.0               | 0                                   | 29377            | 2   | 1                                      | 81                                |                          |
| DEC 5,84        | NOV 6,84         | 1230                     | 1130       | 3  | 66.0               | 0                                   | 29383            | 2   | 1                                      | 97                                |                          |
| JAN 2,85        | DEC 5,84         | 1130                     | 1230       | 3  | 143.0              | 0                                   | 29394            | 2   | 1                                      | 72                                | Q                        |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | VOLUME<br>ML | CONDUCT.<br>UMHO/CM | PH<br>LAB | TOTAL H+<br>TO PH8.3<br>MG/L | SULPHATE<br>MG/L | NITRATE<br>AS N<br>MG/L | CALCIUM<br>MG/L |
|-----------------|------------------|--------------|---------------------|-----------|------------------------------|------------------|-------------------------|-----------------|
| JAN 31,84       | JAN 3,84         | 782.0        | 39.1                | 4.11      | 0.1098                       | 1.65             | 1.04                    | 0.16            |
| FEB 28,84       | JAN 31,84        | 2092.0       | 35.5                | 4.17      | 0.0964                       | 2.50             | 0.68                    | 0.10            |
| MAR 27,84       | FEB 28,84        | 1465.0       | 31.5                | 4.22      | 0.0936                       | 2.40             | 0.53                    | 0.16            |
| APR 24,84       | MAR 27,84        | 1990.0       | 17.1                | 4.51      | 0.0558                       | 1.25             | 0.30                    | 0.12            |
| MAY 22,84       | APR 24,84        | 1927.0       | 30.0                | 4.31      | 0.0868                       | 3.65             | 0.42                    | 0.40            |
| JUN 19,84       | MAY 22,84        | 1409.0       | 24.2                | G 4.65    | 0.0528                       | 4.15             | 0.62                    | 1.01            |
| JUL 17,84       | JUN 19,84        | 2374.0       | 38.1                | 4.11      | 0.0940                       | 3.80             | 0.42                    | 0.12            |
| AUG 14,84       | JUL 17,84        | 2027.0       | 30.0                | 4.26      | 0.0776                       | 2.80             | 0.36                    | 0.14            |
| SEP 11,84       | AUG 14,84        | 2365.0       | 35.9                | 4.11      | 0.0990                       | 3.25             | 0.40                    | 0.11            |
| OCT 9,84        | SEP 11,84        | 1418.0       | 49.5                | 4.07      | 0.1186                       | 4.65             | 0.74                    | 0.31            |
| NOV 6,84        | OCT 9,84         | 1916.0       | 35.0                | 4.22      | 0.0880                       | 3.00             | 0.48                    | 0.17            |
| DEC 5,84        | NOV 6,84         | 2086.0       | 27.0                | 4.31      | 0.0724                       | 2.05             | 0.46                    | 0.20            |
| JAN 2,85        | DEC 5,84         | 3381.0       | 21.3                | 4.41      | *****                        | 1.50             | 0.44                    | 0.13            |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : WILBERFORCE/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | CHLORIDE<br>MG/L | KJELDAHL<br>AS N<br>MG/L | MAGNESIM<br>MG/L | POTASSIM<br>MG/L | SODIUM<br>MG/L | AMMONIUM<br>AS N<br>MG/L | PHOSPHOR<br>MG/L |
|-----------------|------------------|------------------|--------------------------|------------------|------------------|----------------|--------------------------|------------------|
| JAN 31,84       | JAN 3,84         | 0.31             | 0.43                     | 0.030            | 0.020            | 0.160          | 0.310                    | 0.012            |
| FEB 28,84       | JAN 31,84        | 0.24             | 0.37                     | 0.010            | 0.025            | 0.145          | 0.330                    | 0.005            |
| MAR 27,84       | FEB 28,84        | 0.20             | 0.24                     | 0.025            | <T 0.005         | 0.090          | 0.186                    | 0.006            |
| APR 24,84       | MAR 27,84        | 0.07             | 0.35                     | 0.020            | 0.020            | 0.060          | 0.100                    | 0.015            |
| MAY 22,84       | APR 24,84        | 0.18             | 0.52                     | 0.060            | 0.060            | 0.075          | 0.410                    | 0.011            |
| JUN 19,84       | MAY 22,84        | 0.14             | 0.86                     | G 0.235          | 0.120            | 0.085          | 0.590                    | G 0.126          |
| JUL 17,84       | JUN 19,84        | 0.09             | 0.46                     | 0.015            | 0.040            | 0.015          | 0.400                    | 0.006            |
| AUG 14,84       | JUL 17,84        | 0.07             | 0.31                     | 0.035            | <T 0.010         | <T 0.010       | 0.270                    | 0.008            |
| SEP 11,84       | AUG 14,84        | 0.14             | 0.28                     | 0.015            | <T 0.010         | 0.040          | 0.210                    | <T 0.003         |
| OCT 9,84        | SEP 11,84        | 0.15             | 0.55                     | 0.045            | 0.030            | <T 0.015       | 0.540                    | <T 0.003         |
| NOV 6,84        | OCT 9,84         | 0.13             | 0.31                     | 0.015            | <W 0.005         | 0.035          | 0.270                    | <T 0.003         |
| DEC 5,84        | NOV 6,84         | 0.14             | 0.29                     | 0.015            | <W 0.005         | 0.045          | 0.255                    | <T 0.004         |
| JAN 2,85        | DEC 5,84         | 0.14             | 0.23                     | <T 0.015         | <T 0.015         | 0.045          | 0.180                    | <T 0.004         |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | MANGANESE<br>MG/L | NICKEL<br>MG/L | ZINC<br>MG/L | IRON<br>MG/L | LEAD<br>MG/L | VANADIUM<br>MG/L | ALUMINUM<br>MG/L |
|-----------------|------------------|-------------------|----------------|--------------|--------------|--------------|------------------|------------------|
| JAN 31,84       | JAN 3,84         | 0.003             | < 0.001        | 0.009        | 0.064        | 0.010        | < 0.002          | 0.022            |
| FEB 28,84       | JAN 31,84        | 0.001             | < 0.001        | 0.004        | 0.023        | 0.006        | < 0.002          | 0.029            |
| MAR 27,84       | FEB 28,84        | 0.002             | < 0.001        | 0.005        | 0.043        | 0.005        | < 0.002          | 0.034            |
| APR 24,84       | MAR 27,84        | < 0.001           | < 0.001        | < 0.003      | 0.015        | 0.003        | < 0.002          | 0.022            |
| MAY 22,84       | APR 24,84        | 0.007             | < 0.001        | 0.003        | 0.071        | 0.003        | < 0.002          | 0.075            |
| JUN 19,84       | MAY 22,84        | 0.007             | < 0.001        | 0.006        | 0.101        | 0.008        | < 0.002          | 0.106            |
| JUL 17,84       | JUN 19,84        | 0.001             | < 0.001        | 0.003        | 0.025        | 0.003        | < 0.002          | 0.017            |
| AUG 14,84       | JUL 17,84        | 0.002             | < 0.001        | 0.002        | 0.020        | 0.005        | < 0.002          | 0.011            |
| SEP 11,84       | AUG 14,84        | 0.002             | < 0.001        | 0.002        | 0.017        | 0.005        | < 0.002          | 0.049            |
| OCT 9,84        | SEP 11,84        | 0.003             | < 0.001        | 0.006        | 0.028        | 0.007        | < 0.002          | 0.035            |
| NOV 6,84        | OCT 9,84         | 0.001             | < 0.001        | 0.003        | 0.018        | 0.004        | < 0.002          | 0.021            |
| DEC 5,84        | NOV 6,84         | 0.002             | 0.000          | 0.003        | 0.020        | 0.005        | < 0.000          | 0.019            |
| JAN 2,85        | DEC 5,84         | 0.002             | 0.000          | 0.003        | 0.029        | 0.005        | < 0.000          | 0.026            |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

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STATION NAME : WILBERFORCE/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | COPPER<br>MG/L | CADMIUM<br>MG/L | FREE H+<br>MG/L |
|-----------------|------------------|----------------|-----------------|-----------------|
| JAN 31,84       | JAN 3,84         | < 0.002        | 0.0002          | 0.0776          |
| FEB 28,84       | JAN 31,84        | 0.001          | 0.0001          | 0.0676          |
| MAR 27,84       | FEB 28,84        | < 0.002        | < 0.0001        | 0.0603          |
| APR 24,84       | MAR 27,84        | 0.001          | < 0.0001        | 0.0309          |
| MAY 22,84       | APR 24,84        | 0.001          | < 0.0001        | 0.0490          |
| JUN 19,84       | MAY 22,84        | 0.002          | 0.0001          | 6 0.0224        |
| JUL 17,84       | JUN 19,84        | < 0.001        | 0.0001          | 0.0776          |
| AUG 14,84       | JUL 17,84        | < 0.001        | < 0.0001        | 0.0550          |
| SEP 11,84       | AUG 14,84        | < 0.001        | 0.0001          | 0.0776          |
| OCT 9,84        | SEP 11,84        | < 0.002        | 0.0001          | 0.0851          |
| NOV 6,84        | OCT 9,84         | 0.002          | 0.0001          | 0.0603          |
| DEC 5,84        | NOV 6,84         | 0.001          | 0.0001          | 0.0490          |
| JAN 2,85        | DEC 5,84         | 0.001          | 0.0001          | 0.0389          |

PART V

SOUTHEASTERN REGION

CUMULATIVE PRECIPITATION CHEMISTRY LISTINGS



ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

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STATION NAME : CLOYNE/CUMULATIVE PRECIP.

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PAGE : 1

| REMOVAL<br>DATE | EXPOSURE<br>DATE | SAMPLING<br>START<br>HR. | END<br>HR. | SAMPLE<br>TYPE<br>01-RAIN<br>02-SNOW<br>03-COMP/04-OTHER | GAUGE<br>DEPTH(MM) | GAUGE<br>TYPE<br>00-APIOS<br>09-AES | SAMPLE<br>NUMBER | PROJECT<br>CODE<br>02-APIOS<br>03-SPECIAL | SUBPROJECT<br>CODE<br>01-MOE<br>03-AES | SAMPLER<br>EFFICI-<br>ENCY<br>(%) | COMMENTS<br>FIELD OFFICE |
|-----------------|------------------|--------------------------|------------|--|--------------------|-------------------------------------|------------------|---|--|-----------------------------------|--------------------------|
| JAN 2,85        | DEC 4,84         | 800                      | 800        | 3  | *****              | *                                   | 24409            | 2   | 1                                      | ***                               |                          |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | VOLUME<br>ML | CONDUCT.<br>UMHO/CM | PH<br>LAB | TOTAL H+<br>TO PH8.3<br>MG/L | SULPHATE<br>MG/L | NITRATE<br>AS N<br>MG/L | CALCIUM<br>MG/L |
|-----------------|------------------|--------------|---------------------|-----------|------------------------------|------------------|-------------------------|-----------------|
| JAN 2,85        | DEC 4,84         | 1604.0       | 25.2                | 4.36      | *****                        | 2.30             | 0.52                    | 0.40            |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

---

STATION NAME : CLOYNE/CUMULATIVE PRECIP.

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PAGE : 2

| REMOVAL<br>DATE | EXPOSURE<br>DATE | CHLORIDE<br>MG/L | KJELDAHL<br>AS N<br>MG/L | MAGNESIM<br>MG/L | POTASSIM<br>MG/L | SODIUM<br>MG/L | AMMONIUM<br>AS N<br>MG/L | PHOSPHOR<br>MG/L |
|-----------------|------------------|------------------|--------------------------|------------------|------------------|----------------|--------------------------|------------------|
| JAN 2,85        | DEC 4,84         | 0.26             | 0.35                     | 0.030            | 0.070            | 0.100          | 0.260                    | 0.009            |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | MANGANSE<br>MG/L | NICKEL<br>MG/L | ZINC<br>MG/L | IRON<br>MG/L | LEAD<br>MG/L | VANADIUM<br>MG/L | ALUMINUM<br>MG/L |
|-----------------|------------------|------------------|----------------|--------------|--------------|--------------|------------------|------------------|
| JAN 2,85        | DEC 4,84         | 0.002            | 0.001          | 0.007        | 0.023        | 0.007        | < 0.000          | 0.032            |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

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STATION NAME : CLOYNE/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | COPPER<br>MG/L | CADMIUM<br>MG/L | FREE H+<br>MG/L |
|-----------------|------------------|----------------|-----------------|-----------------|
| JAN 2,85        | DEC 4,84         | 0.003          | 0.0005          | 0.0437          |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : DALHOUSIE MILLS/CUMULATIVE PRECIP. #16

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | SAMPLING<br>START<br>HR. | SAMPLING<br>END<br>HR. | SAMPLE<br>TYPE<br>01-RAIN<br>02-SNOW<br>03-COMP/04-OTHER | GAUGE<br>DEPTH(MM) | GAUGE<br>TYPE<br>00-APIOS<br>09-AES | SAMPLE<br>NUMBER | PROJECT<br>CODE<br>02-APIOS<br>03-SPECIAL | SUBPROJECT<br>CODE<br>01-MOE<br>03-AES | SAMPLER<br>EFFICI-<br>ENCY<br>(%) | COMMENTS<br>FIELD OFFICE |
|-----------------|------------------|--------------------------|------------------------|--|--------------------|-------------------------------------|------------------|---|--|-----------------------------------|--------------------------|
| JAN 31,84       | JAN 3,84         | 830                      | 800                    | 2  | 48.7               | 9                                   | 24316            | 2   | 1                                      | 32                                | Q                        |
| FEB 28,84       | JAN 31,84        | 900                      | 800                    | 2  | 32.0               | 0                                   | 24322            | 2   | 1                                      | U 47                              | G                        |
| MAR 27,84       | FEB 28,84        | 900                      | 800                    | 1  | 25.1               | 0                                   | 24327            | 2   | 1                                      | 79                                | A H                      |
| APR 24,84       | MAR 27,84        | 900                      | 800                    | 1  | 65.0               | 0                                   | 24332            | 2   | 1                                      | U 72                              | ACDFJ HM                 |
| MAY 22,84       | APR 24,84        | 900                      | 800                    | 1  | 65.0               | 0                                   | 24341            | 2   | 1                                      | 76                                | BAD                      |
| JUN 19,84       | MAY 22,84        | 900                      | 800                    | 1  | 62.0               | 0                                   | 24351            | 2   | 1                                      | 79                                |                          |
| JUL 17,84       | JUN 19,84        | 900                      | 800                    | 1  | 116.0              | 9                                   | 24365            | 2   | 1                                      | 96                                | ACDF                     |
| AUG 14,84       | JUL 17,84        | 900                      | 800                    | 1  | 55.5               | 9                                   | 24371            | 2   | 1                                      | 51                                | AD N                     |
| SEP 11,84       | AUG 14,84        | 900                      | 800                    | 1  | 156.3              | 9                                   | 24376            | 2   | 1                                      | 96                                | AD N                     |
| OCT 9,84        | SEP 11,84        | 800                      | 900                    | 1  | 38.0               | 0                                   | 24383            | 2   | 1                                      | 86                                | CD                       |
| NOV 6,84        | OCT 9,84         | 900                      | 800                    | 1  | 39.0               | 0                                   | 24389            | 2   | 1                                      | 78                                | D                        |
| DEC 4,84        | NOV 6,84         | 800                      | 800                    | 2  | 79.9               | 9                                   | 24400            | 2   | 1                                      | 74                                | CDP                      |
| JAN 2,85        | DEC 4,84         | 800                      | 800                    | 2  | 93.0               | 9                                   | 24406            | 2   | 1                                      | 47                                | N                        |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | VOLUME<br>ML | CONDUCT.<br>UMHO/CM | PH<br>LAB | TOTAL H+<br>TO PH8.3<br>MG/L | SULPHATE<br>MG/L | NITRATE<br>AS N<br>MG/L | CALCIUM<br>MG/L |
|-----------------|------------------|--------------|---------------------|-----------|------------------------------|------------------|-------------------------|-----------------|
| JAN 31,84       | JAN 3,84         | 507.0        | 55.0                | 4.05      | 0.1328                       | 3.30             | G 1.49                  | D 0.72          |
| FEB 28,84       | JAN 31,84        | 496.0        | 20.4                | 4.51      | 0.0576                       | 1.40             | 0.50                    | 0.18            |
| MAR 27,84       | FEB 28,84        | 649.0        | 28.5                | U 4.89    | 0.0520                       | 3.50             | 0.99                    | U 1.50          |
| APR 24,84       | MAR 27,84        | 1539.0       | 13.3                | U 7.01    | U 0.0254                     | D 2.40           | 0.31                    | 0.58            |
| MAY 22,84       | APR 24,84        | 1623.0       | 25.5                | G 4.66    | 0.0468                       | 3.40             | 0.55                    | 0.77            |
| JUN 19,84       | MAY 22,84        | 1596.0       | 40.3                | 4.19      | 0.0884                       | 4.75             | 0.58                    | 0.49            |
| JUL 17,84       | JUN 19,84        | 3650.0       | 31.6                | 4.18      | 0.0724                       | 3.65             | 0.40                    | 0.17            |
| AUG 14,84       | JUL 17,84        | 926.0        | B 63.8              | U 4.01    | 0.1276                       | U 8.00           | U 0.85                  | D 0.50          |
| SEP 11,84       | AUG 14,84        | 4920.0       | 26.5                | 4.35      | 0.0726                       | 2.80             | 0.24                    | 0.13            |
| OCT 9,84        | SEP 11,84        | 1069.0       | 37.3                | 4.21      | 0.0800                       | 4.70             | 0.76                    | 0.64            |
| NOV 6,84        | OCT 9,84         | 999.0        | 31.4                | 4.18      | 0.0926                       | 3.50             | 0.53                    | 0.21            |
| DEC 4,84        | NOV 6,84         | 1937.0       | 31.5                | 4.23      | 0.0926                       | 2.35             | 0.59                    | 0.12            |
| JAN 2,85        | DEC 4,84         | 1430.0       | 28.3                | 4.32      | *****                        | 2.35             | 0.58                    | D 0.24          |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : DALHOUSIE MILLS/CUMULATIVE PRECIP. #16

PAGE : 2

| REMOVAL<br>DATE | EXPOSURE<br>DATE | CHLORIDE<br>MG/L | KJELDAHL<br>AS N<br>MG/L | MAGNESIM<br>MG/L | POTASSIM<br>MG/L | SODIUM<br>MG/L | AMMONIUM<br>AS N<br>MG/L | PHOSPHOR<br>MG/L |
|-----------------|------------------|------------------|--------------------------|------------------|------------------|----------------|--------------------------|------------------|
| JAN 31,84       | JAN 3,84         | U 0.92           | 0.85                     | D 0.065          | 0.030            | U 0.645        | 0.730                    | 0.017            |
| FEB 28,84       | JAN 31,84        | 0.36             | 0.36                     | 0.030            | <T 0.015         | 0.175          | 0.338                    | 0.012            |
| MAR 27,84       | FEB 28,84        | U 0.82           | D 0.94                   | U 0.185          | D 0.060          | U 0.655        | D 0.690                  | B 0.048          |
| APR 24,84       | MAR 27,84        | D 0.16           | B 1.67                   | 0.075            | D 0.135          | D 0.125        | D 0.615                  | G 0.125          |
| MAY 22,84       | APR 24,84        | 0.12             | 0.85                     | 0.095            | 0.130            | 0.060          | 0.575                    | 0.033            |
| JUN 19,84       | MAY 22,84        | 0.14             | 0.75                     | 0.080            | 0.150            | 0.055          | 0.575                    | 0.020            |
| JUL 17,84       | JUN 19,84        | 0.21             | 0.59                     | 0.035            | 0.035            | 0.030          | 0.370                    | D 0.019          |
| AUG 14,84       | JUL 17,84        | 0.28             | G 1.82                   | 0.090            | 0.105            | 0.095          | G 1.500                  | 0.100            |
| SEP 11,84       | AUG 14,84        | 0.09             | 0.27                     | 0.015            | <W 0.005         | 0.045          | 0.200                    | 0.009            |
| OCT 9,84        | SEP 11,84        | 0.16             | 0.74                     | 0.100            | 0.080            | G 0.345        | 0.650                    | <T 0.003         |
| NOV 6,84        | OCT 9,84         | 0.13             | D 0.55                   | 0.025            | <W 0.005         | 0.040          | D 0.535                  | <T 0.004         |
| DEC 4,84        | NOV 6,84         | 0.22             | 0.36                     | 0.020            | 0.030            | 0.100          | 0.335                    | 0.006            |
| JAN 2,85        | DEC 4,84         | 0.21             | 0.42                     | 0.030            | D 0.085          | 0.115          | 0.340                    | 0.007            |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | MANGANSE<br>MG/L | NICKEL<br>MG/L | ZINC<br>MG/L | IRON<br>MG/L | LEAD<br>MG/L | VANADIUM<br>MG/L | ALUMINUM<br>MG/L |
|-----------------|------------------|------------------|----------------|--------------|--------------|--------------|------------------|------------------|
| JAN 31,84       | JAN 3,84         | G 0.019          | 0.005          | 0.036        | 0.096        | U 0.024      | 0.002            | 0.064            |
| FEB 28,84       | JAN 31,84        | 0.007            | 0.002          | 0.009        | D 0.080      | 0.009        | < 0.002          | 0.104            |
| MAR 27,84       | FEB 28,84        | G 0.017          | 0.002          | 0.024        | G 0.191      | G 0.020      | < 0.002          | B 0.182          |
| APR 24,84       | MAR 27,84        | 0.005            | 0.005          | D 0.016      | D 0.051      | 0.007        | < 0.002          | D 0.034          |
| MAY 22,84       | APR 24,84        | 0.010            | < 0.001        | 0.008        | 0.103        | 0.010        | < 0.002          | 0.116            |
| JUN 19,84       | MAY 22,84        | 0.006            | < 0.001        | 0.006        | 0.055        | 0.011        | < 0.002          | 0.068            |
| JUL 17,84       | JUN 19,84        | 0.002            | < 0.001        | 0.004        | 0.022        | 0.004        | < 0.002          | 0.025            |
| AUG 14,84       | JUL 17,84        | 0.004            | < 0.001        | 0.012        | 0.066        | 0.009        | < 0.002          | 0.067            |
| SEP 11,84       | AUG 14,84        | 0.001            | < 0.001        | 0.011        | 0.026        | 0.005        | < 0.002          | 0.012            |
| OCT 9,84        | SEP 11,84        | 0.006            | < 0.001        | 0.009        | 0.035        | D 0.013      | < 0.002          | 0.059            |
| NOV 6,84        | OCT 9,84         | 0.003            | 0.000          | 0.009        | 0.018        | 0.011        | 0.001            | 0.027            |
| DEC 4,84        | NOV 6,84         | 0.002            | 0.000          | 0.007        | 0.020        | 0.007        | 0.001            | 0.025            |
| JAN 2,85        | DEC 4,84         | 0.005            | 0.001          | 0.007        | 0.031        | 0.013        | 0.001            | 0.030            |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

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STATION NAME : DALHOUSIE MILLS/CUMULATIVE PRECIP. #16

PAGE : 3

| REMOVAL<br>DATE | EXPOSURE<br>DATE | COPPER<br>MG/L | CADMIUM<br>MG/L | FREE H+<br>MG/L |
|-----------------|------------------|----------------|-----------------|-----------------|
| JAN 31,84       | JAN 3,84         | 0.006          | 0.0003          | 0.0891          |
| FEB 28,84       | JAN 31,84        | 0.002          | 0.0001          | 0.0309          |
| MAR 27,84       | FEB 28,84        | 0.004          | 0.0002          | U 0.0129        |
| APR 24,84       | MAR 27,84        | U 0.026        | 0.0002          | U 0.0001        |
| MAY 22,84       | APR 24,84        | < 0.002        | 0.0001          | G 0.0219        |
| JUN 19,84       | MAY 22,84        | < 0.002        | 0.0001          | 0.0646          |
| JUL 17,84       | JUN 19,84        | < 0.001        | 0.0001          | 0.0661          |
| AUG 14,84       | JUL 17,84        | 0.002          | 0.0003          | U 0.0977        |
| SEP 11,84       | AUG 14,84        | < 0.001        | 0.0001          | 0.0447          |
| OCT 9,84        | SEP 11,84        | 0.002          | 0.0001          | 0.0617          |
| NOV 6,84        | OCT 9,84         | 0.001          | 0.0001          | 0.0661          |
| DEC 4,84        | NOV 6,84         | 0.000          | 0.0001          | 0.0589          |
| JAN 2,85        | DEC 4,84         | 0.001          | 0.0001          | 0.0479          |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : GOLDEN LAKE/CUMULATIVE PRECIP.

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PAGE : 1

| REMOVAL<br>DATE | EXPOSURE<br>DATE | SAMPLING<br>START<br>HR. | SAMPLING<br>END<br>HR. | SAMPLE<br>TYPE<br>01-RAIN<br>02-SNOW<br>03-COMP/04-OTHER | GAUGE<br>DEPTH(MM) | GAUGE<br>TYPE<br>00-APIOS<br>09-AES | SAMPLE<br>NUMBER | PROJECT<br>CODE<br>02-APIOS<br>03-SPECIAL | SUBPROJECT<br>CODE<br>01-MOE<br>03-AES | SAMPLER<br>EFFICI-<br>ENCY<br>(%) | COMMENTS<br>FIELD OFFICE |
|-----------------|------------------|--------------------------|------------------------|--|--------------------|-------------------------------------|------------------|---|--|-----------------------------------|--------------------------|
| JAN 31,84       | JAN 3,84         | 650                      | 720                    | 2  | 24.3               | 0                                   | 24319            | 2   | 1                                      | U 68                              | FI                       |
| FEB 28,84       | JAN 31,84        | 725                      | 735                    | 2  | 47.7               | 9                                   | 24326            | 2   | 1                                      | 97                                | N                        |
| MAR 27,84       | FEB 28,84        | 740                      | 720                    | 3  | 60.0               | 0                                   | 24330            | 2   | 1                                      | 83                                |                          |
| APR 24,84       | MAR 27,84        | 725                      | 725                    | 1  | 91.3               | 9                                   | 24338            | 2   | 1                                      | 94                                | DP                       |
| MAY 22,84       | APR 24,84        | 730                      | 640                    | 1  | 69.0               | 0                                   | 24344            | 2   | 1                                      | 82                                | D                        |
| JUN 19,84       | MAY 22,84        | 645                      | 755                    | 1  | 36.4               | 9                                   | 24349            | 2   | 1                                      | 98                                |                          |
| JUL 17,84       | JUN 19,84        | 800                      | 630                    | 1  | 112.9              | 9                                   | 24362            | 2   | 1                                      | 58                                | CD                       |
| AUG 14,84       | JUL 17,84        | 635                      | 635                    | 1  | 58.9               | 9                                   | 24373            | 2   | 1                                      | 57                                | F H                      |
| SEP 11,84       | AUG 14,84        | 640                      | 730                    | 1  | 68.0               | 0                                   | 24379            | 2   | 1                                      | 75                                | AD                       |
| OCT 9,84        | SEP 11,84        | 730                      | 710                    | 1  | 44.0               | 0                                   | 24384            | 2   | 1                                      | 93                                | AD                       |
| NOV 6,84        | OCT 9,84         | 710                      | 730                    | 1  | 43.0               | 0                                   | 24390            | 2   | 1                                      | 88                                |                          |
| DEC 4,84        | NOV 6,84         | 730                      | 745                    | 3  | 61.0               | 0                                   | 24401            | 2   | 1                                      | 84                                |                          |
| JAN 2,85        | DEC 4,84         | 745                      | 830                    | 3  | 90.0               | 0                                   | 24407            | 2   | 1                                      | 95                                | C M                      |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | VOLUME<br>ML | CONDUCT.<br>UMHO/CM | PH<br>LAB | TOTAL H+<br>TO PH8.3<br>MG/L | SULPHATE<br>MG/L | NITRATE<br>AS N<br>MG/L | CALCIUM<br>MG/L |
|-----------------|------------------|--------------|---------------------|-----------|------------------------------|------------------|-------------------------|-----------------|
| JAN 31,84       | JAN 3,84         | 538.0        | 44.0                | 4.04      | 0.1290                       | 0.95             | G 1.19                  | 0.13            |
| FEB 28,84       | JAN 31,84        | 1510.0       | 21.5                | 4.51      | 0.0588                       | 1.95             | 0.52                    | 0.30            |
| MAR 27,84       | FEB 28,84        | 1631.0       | 23.7                | 4.41      | 0.0692                       | 1.95             | 0.38                    | 0.18            |
| APR 24,84       | MAR 27,84        | 2805.0       | 16.6                | 4.53      | 0.0574                       | 1.40             | 0.26                    | 0.11            |
| MAY 22,84       | APR 24,84        | 1839.0       | 31.5                | 4.29      | 0.0784                       | 3.45             | 0.42                    | 0.45            |
| JUN 19,84       | MAY 22,84        | 1160.0       | 35.2                | 4.22      | 0.0916                       | 5.50             | 0.67                    | 0.65            |
| JUL 17,84       | JUN 19,84        | 2130.0       | 39.4                | 4.10      | 0.0870                       | 4.50             | 0.46                    | 0.17            |
| AUG 14,84       | JUL 17,84        | 1105.0       | 19.3                | U 5.70    | 0.0360                       | 3.75             | 0.37                    | 0.20            |
| SEP 11,84       | AUG 14,84        | 1671.0       | 21.7                | 4.40      | 0.0606                       | 1.95             | 0.26                    | 0.11            |
| OCT 9,84        | SEP 11,84        | 1334.0       | 37.6                | 4.12      | 0.0916                       | 3.85             | 0.59                    | 0.30            |
| NOV 6,84        | OCT 9,84         | 1230.0       | 25.5                | 4.26      | 0.0734                       | 2.20             | 0.31                    | 0.17            |
| DEC 4,84        | NOV 6,84         | 1666.0       | 21.2                | 4.39      | 0.0664                       | 1.60             | 0.33                    | 0.07            |
| JAN 2,85        | DEC 4,84         | 2795.0       | 15.8                | 4.53      | *****                        | 0.95             | 0.31                    | <T 0.04         |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : GOLDEN LAKE/CUMULATIVE PRECIP.

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PAGE : 2

| REMOVAL<br>DATE | EXPOSURE<br>DATE | CHLORIDE<br>MG/L | KJELDAHL<br>AS N<br>MG/L | MAGNESIUM<br>MG/L | POTASSIUM<br>MG/L | SODIUM<br>MG/L | AMMONIUM<br>AS N<br>MG/L | PHOSPHOR<br>MG/L |
|-----------------|------------------|------------------|--------------------------|-------------------|-------------------|----------------|--------------------------|------------------|
| JAN 31,84       | JAN 3,84         | 0.37             | 0.20                     | 0.035             | <W 0.005          | 0.145          | 0.100                    | 0.012            |
| FEB 28,84       | JAN 31,84        | 0.42             | U 2.58                   | 0.055             | U 0.260           | U 0.490        | 0.218                    | 0.015            |
| MAR 27,84       | FEB 28,84        | 0.17             | 0.17                     | 0.045             | 0.025             | 0.125          | 0.124                    | 0.011            |
| APR 24,84       | MAR 27,84        | 0.05             | 0.55                     | 0.020             | 0.040             | 0.050          | 0.110                    | G 0.080          |
| MAY 22,84       | APR 24,84        | 0.09             | 0.69                     | 0.075             | 0.100             | 0.050          | 0.265                    | 0.034            |
| JUN 19,84       | MAY 22,84        | 0.22             | 1.26                     | 0.130             | 0.240             | 0.095          | 0.880                    | 0.041            |
| JUL 17,84       | JUN 19,84        | 0.14             | 0.69                     | 0.030             | 0.025             | <W 0.005       | 0.550                    | 0.010            |
| AUG 14,84       | JUL 17,84        | 0.19             | G 2.03                   | 0.060             | <W 0.005          | 0.035          | G 1.400                  | U 0.333          |
| SEP 11,84       | AUG 14,84        | 0.07             | 0.30                     | 0.015             | <W 0.005          | 0.025          | 0.160                    | 0.006            |
| OCT 9,84        | SEP 11,84        | 0.10             | 0.66                     | 0.050             | 0.030             | 0.025          | 0.490                    | 0.009            |
| NOV 6,84        | OCT 9,84         | 0.12             | 0.20                     | 0.015             | <W 0.005          | 0.045          | 0.145                    | 0.006            |
| DEC 4,84        | NOV 6,84         | 0.08             | 0.15                     | <T 0.005          | <T 0.020          | 0.025          | 0.130                    | <T 0.002         |
| JAN 2,85        | DEC 4,84         | 0.13             | 0.09                     | <T 0.010          | <W 0.005          | <T 0.010       | 0.040                    | <T 0.004         |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | MANGANESE<br>MG/L | NICKEL<br>MG/L | ZINC<br>MG/L | IRON<br>MG/L | LEAD<br>MG/L | VANADIUM<br>MG/L | ALUMINUM<br>MG/L |
|-----------------|------------------|-------------------|----------------|--------------|--------------|--------------|------------------|------------------|
| JAN 31,84       | JAN 3,84         | 0.002             | < 0.001        | 0.005        | 0.019        | 0.005        | < 0.002          | 0.045            |
| FEB 28,84       | JAN 31,84        | 0.003             | < 0.001        | 0.015        | 0.022        | 0.009        | < 0.002          | 0.051            |
| MAR 27,84       | FEB 28,84        | 0.002             | < 0.001        | 0.005        | 0.022        | 0.008        | < 0.002          | 0.031            |
| APR 24,84       | MAR 27,84        | *****             | *****          | *****        | *****        | *****        | *****            | *****            |
| MAY 22,84       | APR 24,84        | 0.010             | < 0.001        | 0.004        | 0.093        | 0.008        | < 0.002          | 0.094            |
| JUN 19,84       | MAY 22,84        | 0.010             | < 0.001        | 0.007        | 0.075        | 0.010        | < 0.002          | 0.078            |
| JUL 17,84       | JUN 19,84        | 0.002             | < 0.001        | 0.003        | 0.025        | 0.006        | < 0.002          | 0.017            |
| AUG 14,84       | JUL 17,84        | 0.002             | < 0.001        | 0.006        | 0.029        | 0.007        | < 0.002          | 0.017            |
| SEP 11,84       | AUG 14,84        | 0.002             | < 0.001        | 0.006        | 0.016        | 0.004        | < 0.002          | 0.014            |
| OCT 9,84        | SEP 11,84        | 0.003             | < 0.001        | 0.005        | 0.017        | 0.007        | < 0.002          | 0.031            |
| NOV 6,84        | OCT 9,84         | 0.001             | < 0.000        | 0.003        | 0.023        | 0.007        | < 0.000          | 0.017            |
| DEC 4,84        | NOV 6,84         | 0.001             | < 0.000        | 0.003        | 0.009        | 0.004        | < 0.000          | 0.017            |
| JAN 2,85        | DEC 4,84         | 0.001             | 0.000          | < 0.003      | 0.016        | 0.003        | < 0.000          | 0.014            |



ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

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STATION NAME : GOLDEN LAKE/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | COPPER<br>MG/L | CADMIUM<br>MG/L | FREE H+<br>MG/L |
|-----------------|------------------|----------------|-----------------|-----------------|
| JAN 31,84       | JAN 3,84         | < 0.003        | < 0.0001        | 0.0912          |
| FEB 28,84       | JAN 31,84        | 0.007          | 0.0003          | 0.0309          |
| MAR 27,84       | FEB 28,84        | < 0.002        | < 0.0001        | 0.0389          |
| APR 24,84       | MAR 27,84        | *****          | *****           | 0.0295          |
| MAY 22,84       | APR 24,84        | < 0.002        | 0.0001          | 0.0513          |
| JUN 19,84       | MAY 22,84        | < 0.002        | 0.0001          | 0.0603          |
| JUL 17,84       | JUN 19,84        | < 0.001        | 0.0001          | 0.0794          |
| AUG 14,84       | JUL 17,84        | 0.001          | 0.0001          | U 0.0020        |
| SEP 11,84       | AUG 14,84        | < 0.002        | 0.0001          | 0.0398          |
| OCT 9,84        | SEP 11,84        | 0.002          | 0.0001          | 0.0759          |
| NOV 6,84        | OCT 9,84         | 0.002          | 0.0000          | 0.0550          |
| DEC 4,84        | NOV 6,84         | 0.000          | < 0.0000        | 0.0407          |
| JAN 2,85        | DEC 4,84         | 0.000          | 0.0000          | 0.0295          |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : SMITH'S FALLS/CUMULATIVE PRECIP.

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PAGE : 1

| REMOVAL<br>DATE | EXPOSURE<br>DATE | SAMPLING<br>START<br>HR. | SAMPLING<br>END<br>HR. | SAMPLE<br>TYPE<br>01-RAIN<br>02-SNOW<br>03-COMP/04-OTHER | GAUGE<br>DEPTH(MM) | GAUGE<br>TYPE<br>00-APIOS<br>09-AES | SAMPLE<br>NUMBER | PROJECT<br>CODE<br>02-APIOS<br>03-SPECIAL | SUBPROJECT<br>CODE<br>01-MOE<br>03-AES | SAMPLER<br>EFFICI-<br>ENCY<br>(%) | COMMENTS<br>FIELD | OFFICE |
|-----------------|------------------|--------------------------|------------------------|--|--------------------|-------------------------------------|------------------|---|--|-----------------------------------|-------------------|--------|
| JAN 31,84       | JAN 3,84         | 930                      | 1135                   | 2  | 24.3               | 0                                   | 24314            | 2   | 1                                      | 54                                |                   |        |
| FEB 28,84       | JAN 31,84        | 1135                     | 1000                   | 2  | 38.0               | 0                                   | 24323            | 2   | 1                                      | 76                                |                   |        |
| MAR 27,84       | FEB 28,84        | 1000                     | 940                    | 4  | 35.0               | 0                                   | 24328            | 2   | 1                                      | 38                                |                   | NHM    |
| APR 24,84       | MAR 27,84        | 940                      | 900                    | 1  | 117.5              | 9                                   | 24334            | 2   | 1                                      | 64                                | AFD               |        |
| MAY 22,84       | APR 24,84        | 945                      | 1140                   | 1  | 88.0               | 9                                   | 24342            | 2   | 1                                      | 60                                | DA                | NH     |
| JUN 19,84       | MAY 22,84        | 1140                     | 940                    | 1  | 49.0               | 0                                   | 24348            | 2   | 1                                      | 72                                | AQ                | C      |
| JUL 17,84       | JUN 19,84        | 940                      | 940                    | 1  | 60.0               | 0                                   | 24359            | 2   | 1                                      | 82                                |                   | T      |
| AUG 14,84       | JUL 17,84        | 945                      | 1045                   | 1  | 120.0              | 0                                   | 24372            | 2   | 1                                      | 102                               |                   | N      |
| SEP 11,84       | AUG 14,84        | 1045                     | 930                    | 1  | 69.0               | 0                                   | 24377            | 2   | 1                                      | 79                                | AD                |        |
| OCT 9,84        | SEP 11,84        | 930                      | 1045                   | 1  | 36.2               | 9                                   | 24382            | 2   | 1                                      | 58                                | D                 | N      |
| NOV 6,84        | OCT 9,84         | 1045                     | 1010                   | 1  | 37.0               | 0                                   | 24388            | 2   | 1                                      | 65                                |                   |        |
| DEC 4,84        | NOV 6,84         | 1010                     | 915                    | 2  | 37.0               | 0                                   | 24399            | 2   | 1                                      | 73                                | C                 |        |
| JAN 2,85        | DEC 4,84         | 1010                     | 1100                   | 2  | 80.0               | 0                                   | 24405            | 2   | 1                                      | 51                                |                   |        |

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | VOLUME<br>ML | CONDUCT.<br>UMHO/CM | PH<br>LAB | TOTAL H+<br>TO PH8.3<br>MG/L | SULPHATE<br>MG/L | NITRATE<br>AS N<br>MG/L | CALCIUM<br>MG/L |
|-----------------|------------------|--------------|---------------------|-----------|------------------------------|------------------|-------------------------|-----------------|
| JAN 31,84       | JAN 3,84         | 430.0        | *****               | *****     | *****                        | *****            | *****                   | *****           |
| FEB 28,84       | JAN 31,84        | 947.0        | 24.6                | 4.47      | 0.0644                       | 2.00             | 0.54                    | 0.34            |
| MAR 27,84       | FEB 28,84        | 440.0        | 21.0                | U 7.52    | 0.0182                       | 3.20             | 0.75                    | U 1.73          |
| APR 24,84       | MAR 27,84        | 2450.0       | 13.0                | 4.78      | 0.0434                       | 1.45             | 0.27                    | 0.33            |
| MAY 22,84       | APR 24,84        | 1731.0       | 26.0                | U 5.39    | 0.0256                       | 4.45             | 0.67                    | U 1.44          |
| JUN 19,84       | MAY 22,84        | 1155.0       | 40.5                | U 7.39    | 0.0298                       | 5.10             | 0.44                    | 1.03            |
| JUL 17,84       | JUN 19,84        | 1607.0       | D 59.8              | D 3.87    | D 0.1276                     | 6.05             | D 0.73                  | 0.23            |
| AUG 14,84       | JUL 17,84        | 4010.0       | 32.0                | 4.21      | 0.0784                       | 2.80             | 0.43                    | 0.17            |
| SEP 11,84       | AUG 14,84        | 1792.0       | 36.9                | 4.17      | 0.0930                       | 3.65             | 0.39                    | 0.15            |
| OCT 9,84        | SEP 11,84        | 685.0        | 41.1                | 4.08      | 0.0956                       | 4.30             | 0.81                    | 0.60            |
| NOV 6,84        | OCT 9,84         | 782.0        | 33.5                | 4.19      | 0.0836                       | 2.85             | 0.54                    | 0.25            |
| DEC 4,84        | NOV 6,84         | 882.0        | D 45.6              | 4.08      | 0.1218                       | 3.05             | D 1.00                  | 0.21            |
| JAN 2,85        | DEC 4,84         | 1345.0       | 28.2                | 4.27      | *****                        | 1.90             | 0.56                    | 0.10            |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : SMITH'S FALLS/CUMULATIVE PRECIP.

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PAGE : 2

| REMOVAL<br>DATE | EXPOSURE<br>DATE | CHLORIDE<br>MG/L | KJELDAHL<br>AS N<br>MG/L | MAGNESIM<br>MG/L | POTASSIM<br>MG/L | SODIUM<br>MG/L | AMMONIUM<br>AS N<br>MG/L | PHOSPHOR<br>MG/L |
|-----------------|------------------|------------------|--------------------------|------------------|------------------|----------------|--------------------------|------------------|
| JAN 31,84       | JAN 3,84         | *****            | *****                    | *****            | *****            | *****          | *****                    | *****            |
| FEB 28,84       | JAN 31,84        | U 0.74           | 0.27                     | D 0.120          | <T 0.005         | U 0.520        | 0.154                    | B 0.064          |
| MAR 27,84       | FEB 28,84        | U 0.85           | 0.41                     | U 0.630          | 0.025            | U 0.635        | 0.236                    | 0.015            |
| APR 24,84       | MAR 27,84        | 0.07             | 0.22                     | 0.085            | 0.050            | 0.060          | 0.145                    | 0.014            |
| MAY 22,84       | APR 24,84        | 0.18             | 0.68                     | U 0.430          | 0.080            | 0.095          | 0.455                    | 0.027            |
| JUN 19,84       | MAY 22,84        | U 0.48           | U 6.05                   | U 0.400          | U 0.380          | U 0.415        | U 2.600                  | U 0.400          |
| JUL 17,84       | JUN 19,84        | 0.27             | 0.61                     | 0.055            | 0.030            | 0.035          | 0.495                    | 0.005            |
| AUG 14,84       | JUL 17,84        | 0.13             | 0.29                     | 0.030            | <T 0.005         | 0.035          | 0.235                    | <W 0.001         |
| SEP 11,84       | AUG 14,84        | 0.10             | 0.34                     | 0.035            | <T 0.010         | 0.050          | 0.290                    | <T 0.002         |
| OCT 9,84        | SEP 11,84        | 0.16             | 0.56                     | 0.105            | 0.030            | 0.055          | 0.505                    | <T 0.001         |
| NOV 6,84        | OCT 9,84         | D 0.17           | 0.32                     | 0.045            | <W 0.005         | 0.060          | 0.280                    | <T 0.003         |
| DEC 4,84        | NOV 6,84         | 0.25             | 0.42                     | 0.040            | 0.030            | 0.095          | 0.425                    | 0.006            |
| JAN 2,85        | DEC 4,84         | 0.16             | 0.33                     | 0.020            | 0.025            | 0.065          | 0.235                    | 0.006            |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | MANGANSE<br>MG/L | NICKEL<br>MG/L | ZINC<br>MG/L | IRON<br>MG/L | LEAD<br>MG/L | VANADIUM<br>MG/L | ALUMINUM<br>MG/L |
|-----------------|------------------|------------------|----------------|--------------|--------------|--------------|------------------|------------------|
| JAN 31,84       | JAN 3,84         | *****            | *****          | *****        | *****        | *****        | *****            | *****            |
| FEB 28,84       | JAN 31,84        | 0.003            | < 0.001        | 0.015        | 0.022        | 0.007        | < 0.002          | 0.076            |
| MAR 27,84       | FEB 28,84        | 0.010            | < 0.001        | U 0.054      | 0.117        | 0.016        | < 0.002          | 0.063            |
| APR 24,84       | MAR 27,84        | 0.003            | < 0.001        | 0.004        | 0.019        | 0.005        | < 0.002          | 0.022            |
| MAY 22,84       | APR 24,84        | G 0.014          | < 0.001        | 0.010        | 0.106        | 0.010        | < 0.002          | 0.126            |
| JUN 19,84       | MAY 22,84        | G 0.013          | < 0.001        | B 0.021      | 0.120        | 0.010        | < 0.002          | 0.145            |
| JUL 17,84       | JUN 19,84        | 0.003            | < 0.001        | L 0.005      | L 0.013      | L 0.006      | < 0.002          | L 0.026          |
| AUG 14,84       | JUL 17,84        | 0.003            | < 0.001        | 0.004        | 0.020        | 0.004        | < 0.002          | 0.014            |
| SEP 11,84       | AUG 14,84        | 0.002            | < 0.001        | 0.007        | 0.020        | 0.002        | < 0.002          | 0.031            |
| OCT 9,84        | SEP 11,84        | 0.007            | < 0.001        | 0.008        | 0.032        | 0.006        | < 0.002          | 0.056            |
| NOV 6,84        | OCT 9,84         | 0.002            | 0.000          | 0.009        | D 0.055      | 0.004        | 0.001            | 0.035            |
| DEC 4,84        | NOV 6,84         | 0.003            | 0.000          | 0.008        | 0.026        | 0.011        | 0.001            | 0.038            |
| JAN 2,85        | DEC 4,84         | 0.002            | < 0.000        | 0.005        | 0.017        | 0.008        | 0.001            | 0.025            |

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ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

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STATION NAME : SMITH'S FALLS/CUMULATIVE PRECIP.

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PAGE : 3

| REMOVAL<br>DATE | EXPOSURE<br>DATE | COPPER<br>MG/L | CADMIUM<br>MG/L | FREE H+<br>MG/L |
|-----------------|------------------|----------------|-----------------|-----------------|
| JAN 31,84       | JAN 3,84         | *****          | *****           | *****           |
| FEB 28,84       | JAN 31,84        | 0.002          | < 0.0001        | 0.0339          |
| MAR 27,84       | FEB 28,84        | < 0.003        | 0.0001          | U 0.0000        |
| APR 24,84       | MAR 27,84        | 0.001          | < 0.0001        | 0.0166          |
| MAY 22,84       | APR 24,84        | 0.001          | 0.0002          | U 0.0041        |
| JUN 19,84       | MAY 22,84        | 0.005          | 0.0001          | U 0.0000        |
| JUL 17,84       | JUN 19,84        | L< 0.001       | 0.0001          | D 0.1349        |
| AUG 14,84       | JUL 17,84        | < 0.001        | < 0.0001        | 0.0617          |
| SEP 11,84       | AUG 14,84        | < 0.002        | 0.0001          | 0.0676          |
| OCT 9,84        | SEP 11,84        | < 0.002        | 0.0001          | 0.0832          |
| NOV 6,84        | OCT 9,84         | 0.001          | 0.0001          | 0.0646          |
| DEC 4,84        | NOV 6,84         | 0.001          | 0.0001          | 0.0832          |
| JAN 2,85        | DEC 4,84         | 0.000          | 0.0001          | 0.0537          |

PART VI

NORTHEASTERN REGION

CUMULATIVE PRECIPITATION CHEMISTRY LISTINGS

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : ATTAWAPISKAT/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | SAMPLING<br>START<br>HR. | END<br>HR. | SAMPLE<br>TYPE<br>01-RAIN<br>02-SNOW<br>03-COMP/04-OTHER | GAUGE<br>DEPTH(MM) | GAUGE<br>TYPE<br>00-APIOS<br>09-AES | SAMPLE<br>NUMBER | PROJECT<br>CODE<br>02-APIOS<br>03-SPECIAL | SUBPROJECT<br>CODE<br>01-MOE<br>03-AES | SAMPLER<br>EFFICI-<br>ENCY<br>(%) | COMMENTS<br>FIELD OFFICE |
|-----------------|------------------|--------------------------|------------|--|--------------------|-------------------------------------|------------------|---|--|-----------------------------------|--------------------------|
| JAN 31,84       | JAN 3,84         | 1345                     | 945        | 2  | *****              | *                                   | 11783            | 2   | 1                                      | ***                               | E                        |
| FEB 28,84       | JAN 31,84        | 1300                     | 1200       | 2  | *****              | *                                   | 11769            | 2   | 1                                      | ***                               | E                        |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | VOLUME<br>ML | CONDUCT.<br>UMHO/CM | PH<br>LAB | TOTAL H+<br>TO PH8.3<br>MG/L | SULPHATE<br>MG/L | NITRATE<br>AS N<br>MG/L | CALCIUM<br>MG/L |
|-----------------|------------------|--------------|---------------------|-----------|------------------------------|------------------|-------------------------|-----------------|
| JAN 31,84       | JAN 3,84         | 18.0         | *****               | *****     | *****                        | *****            | *****                   | *****           |
| FEB 28,84       | JAN 31,84        | 0.0          | *****               | *****     | *****                        | *****            | *****                   | *****           |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

---

STATION NAME : ATTAWAPISKAT/CUMULATIVE PRECIP.

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PAGE : 2

| REMOVAL<br>DATE | EXPOSURE<br>DATE | CHLORIDE<br>MG/L | KJELDAHL<br>AS N<br>MG/L | MAGNESIM<br>MG/L | POTASSIM<br>MG/L | SODIUM<br>MG/L | AMMONIUM<br>AS N<br>MG/L | PHOSPHOR<br>MG/L |
|-----------------|------------------|------------------|--------------------------|------------------|------------------|----------------|--------------------------|------------------|
| JAN 31,84       | JAN 3,84         | *****            | *****                    | *****            | *****            | *****          | *****                    | *****            |
| FEB 28,84       | JAN 31,84        | *****            | *****                    | *****            | *****            | *****          | *****                    | *****            |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | MANGANSE<br>MG/L | NICKEL<br>MG/L | ZINC<br>MG/L | IRON<br>MG/L | LEAD<br>MG/L | VANADIUM<br>MG/L | ALUMINUM<br>MG/L |
|-----------------|------------------|------------------|----------------|--------------|--------------|--------------|------------------|------------------|
| JAN 31,84       | JAN 3,84         | *****            | *****          | *****        | *****        | *****        | *****            | *****            |
| FEB 28,84       | JAN 31,84        | *****            | *****          | *****        | *****        | *****        | *****            | *****            |

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ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

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STATION NAME : ATTAWAPISKAT/CUMULATIVE PRECIP.

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PAGE : 3

| REMOVAL<br>DATE | EXPOSURE<br>DATE | COPPER<br>MG/L | CADMIUM<br>MG/L | FREE H+<br>MG/L |
|-----------------|------------------|----------------|-----------------|-----------------|
| JAN 31,84       | JAN 3,84         | *****          | *****           | *****           |
| FEB 28,84       | JAN 31,84        | *****          | *****           | *****           |



ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : AZURE LAKE/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | SAMPLING<br>START<br>HR. | SAMPLING<br>END<br>HR. | SAMPLE<br>TYPE<br>01-RAIN<br>02-SNOW<br>03-COMP/04-OTHER | GAUGE<br>DEPTH(MM) | GAUGE<br>TYPE<br>00-APIOS<br>09-AES | SAMPLE<br>NUMBER | PROJECT<br>CODE<br>02-APIOS<br>03-SPECIAL | SUBPROJECT<br>CODE<br>01-MOE<br>03-AES | SAMPLER<br>EFFICI-<br>ENCY<br>(%) | COMMENTS<br>FIELD OFFICE |
|-----------------|------------------|--------------------------|------------------------|--|--------------------|-------------------------------------|------------------|---|--|-----------------------------------|--------------------------|
| FEB 1,84        | JAN 9,84         | 1030                     | 1030                   | 3  | 31.1               | 0                                   | 11775            | 2   | 1                                      | U 30                              | G N                      |
| MAR 28,84       | MAR 5,84         | 1000                     | 1030                   | 4  | 20.6               | 0                                   | 11807            | 2   | 1                                      | 77                                |                          |
| APR 24,84       | MAR 28,84        | 1030                     | 830                    | 1  | 37.3               | 0                                   | 11824            | 2   | 1                                      | 68                                | C                        |
| MAY 22,84       | APR 24,84        | 830                      | 900                    | 1  | 62.6               | 9                                   | 11831            | 2   | 1                                      | 36                                | CD                       |
| JUN 21,84       | MAY 22,84        | 900                      | 1000                   | 1  | 102.7              | 0                                   | 11851            | 2   | 1                                      | 62                                | AC                       |
| JUL 18,84       | JUN 21,84        | 1100                     | 1500                   | 1  | 169.0              | 0                                   | 11863            | 2   | 1                                      | U 34                              | ADQG                     |
| AUG 15,84       | JUL 18,84        | 1500                     | 1025                   | 1  | 35.0               | 0                                   | 11877            | 2   | 1                                      | 80                                | CD                       |
| SEP 11,84       | AUG 15,84        | 1025                     | 1040                   | 1  | 79.0               | 0                                   | 35225            | 2   | 1                                      | 86                                | BC                       |
| OCT 10,84       | SEP 11,84        | 1040                     | 1215                   | 1  | 81.0               | 0                                   | 35239            | 2   | 1                                      | 86                                | DC                       |
| NOV 7,84        | OCT 10,84        | 1215                     | 1400                   | 3  | 82.5               | 9                                   | 35252            | 2   | 1                                      | 90                                | ACD                      |
| DEC 4,84        | NOV 7,84         | 1400                     | 1400                   | 3  | 52.7               | 0                                   | 35277            | 2   | 1                                      | 76                                |                          |
| JAN 10,85       | DEC 4,84         | 1400                     | 1130                   | 3  | 68.0               | 0                                   | 35317            | 2   | 1                                      | 79                                | M                        |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | VOLUME<br>ML | CONDUCT.<br>UMHO/CM | PH<br>LAB | TOTAL H+<br>TO PH8.3<br>MG/L | SULPHATE<br>MG/L | NITRATE<br>AS N<br>MG/L | CALCIUM<br>MG/L |
|-----------------|------------------|--------------|---------------------|-----------|------------------------------|------------------|-------------------------|-----------------|
| FEB 1,84        | JAN 9,84         | 305.0        | 28.7                | 4.25      | 0.0868                       | 1.20             | 0.73                    | 0.08            |
| MAR 28,84       | MAR 5,84         | 516.0        | 50.0                | 3.99      | 0.1344                       | 4.35             | 0.69                    | 0.14            |
| APR 24,84       | MAR 28,84        | 827.0        | 15.7                | 4.53      | 0.0592                       | 1.55             | 0.10                    | 0.06            |
| MAY 22,84       | APR 24,84        | 750.0        | 30.9                | 4.41      | 0.0736                       | 4.40             | 0.60                    | G 0.85          |
| JUN 21,84       | MAY 22,84        | 2083.0       | 21.6                | 4.51      | 0.0536                       | 2.55             | 0.30                    | 0.16            |
| JUL 18,84       | JUN 21,84        | 1911.0       | 13.0                | 4.64      | 0.0500                       | 1.75             | 0.18                    | 0.10            |
| AUG 15,84       | JUL 18,84        | 910.0        | 24.9                | 4.41      | 0.0588                       | 3.30             | 0.28                    | 0.28            |
| SEP 11,84       | AUG 15,84        | 2226.0       | 17.8                | 4.75      | 0.0392                       | 2.15             | 0.20                    | 0.12            |
| OCT 10,84       | SEP 11,84        | 2273.0       | 16.1                | 4.58      | 0.0488                       | 1.55             | 0.19                    | 0.08            |
| NOV 7,84        | OCT 10,84        | 2411.0       | 18.9                | 4.52      | 0.0518                       | 1.60             | 0.23                    | 0.08            |
| DEC 4,84        | NOV 7,84         | 1315.0       | 16.7                | 4.57      | 0.0502                       | D 1.00           | 0.35                    | 0.04            |
| JAN 10,85       | DEC 4,84         | 1759.0       | 15.4                | 4.59      | 0.0470                       | 0.95             | 0.27                    | <T 0.04         |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : AZURE LAKE/CUMULATIVE PRECIP.

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PAGE : 2

| REMOVAL<br>DATE | EXPOSURE<br>DATE | CHLORIDE<br>MG/L | KJELDAHL<br>AS N<br>MG/L | MAGNESIM<br>MG/L | POTASSIM<br>MG/L | SODIUM<br>MG/L | AMMONIUM<br>AS N<br>MG/L | PHOSPHOR<br>MG/L |
|-----------------|------------------|------------------|--------------------------|------------------|------------------|----------------|--------------------------|------------------|
| FEB 1,84        | JAN 9,84         | 0.13             | 0.19                     | 0.010            | <T 0.015         | 0.050          | 0.086                    | 0.007            |
| MAR 28,84       | MAR 5,84         | 0.23             | 0.39                     | 0.030            | 0.030            | 0.100          | 0.310                    | 0.007            |
| APR 24,84       | MAR 28,84        | 0.04             | 0.14                     | 0.010            | 0.035            | 0.030          | 0.070                    | <T 0.004         |
| MAY 22,84       | APR 24,84        | 0.20             | 0.80                     | 0.130            | 0.140            | 0.090          | 0.575                    | G 0.128          |
| JUN 21,84       | MAY 22,84        | 0.09             | 0.56                     | 0.030            | 0.105            | 0.055          | 0.385                    | 0.024            |
| JUL 18,84       | JUN 21,84        | 0.09             | 0.50                     | 0.010            | 0.030            | 0.030          | 0.260                    | 0.017            |
| AUG 15,84       | JUL 18,84        | 0.08             | 0.67                     | 0.070            | 0.100            | 0.030          | 0.390                    | 0.028            |
| SEP 11,84       | AUG 15,84        | U 0.74           | 0.64                     | 0.015            | B 0.330          | U 0.595        | 0.325                    | 0.007            |
| OCT 10,84       | SEP 11,84        | <T 0.02          | 0.16                     | 0.005            | <T 0.005         | <T 0.005       | 0.130                    | <T 0.003         |
| NOV 7,84        | OCT 10,84        | 0.10             | 0.19                     | 0.010            | <T 0.005         | 0.035          | 0.150                    | <T 0.002         |
| DEC 4,84        | NOV 7,84         | 0.15             | 0.23                     | 0.005            | 0.020            | 0.110          | 0.140                    | <T 0.004         |
| JAN 10,85       | DEC 4,84         | 0.10             | 0.12                     | <W 0.005         | <T 0.020         | <T 0.015       | 0.075                    | <T 0.002         |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | MANGANSE<br>MG/L | NICKEL<br>MG/L | ZINC<br>MG/L | IRON<br>MG/L | LEAD<br>MG/L | VANADIUM<br>MG/L | ALUMINUM<br>MG/L |
|-----------------|------------------|------------------|----------------|--------------|--------------|--------------|------------------|------------------|
| FEB 1,84        | JAN 9,84         | 0.002            | 0.005          | 0.010        | B 0.140      | 0.007        | < 0.002          | 0.085            |
| MAR 28,84       | MAR 5,84         | 0.002            | < 0.001        | 0.018        | 0.034        | 0.010        | < 0.002          | 0.047            |
| APR 24,84       | MAR 28,84        | 0.001            | < 0.001        | 0.009        | 0.020        | 0.015        | < 0.002          | 0.024            |
| MAY 22,84       | APR 24,84        | G 0.014          | < 0.001        | 0.007        | G 0.187      | 0.008        | < 0.002          | G 0.296          |
| JUN 21,84       | MAY 22,84        | 0.005            | < 0.001        | 0.003        | 0.057        | 0.007        | < 0.002          | 0.071            |
| JUL 18,84       | JUN 21,84        | 0.002            | < 0.001        | 0.003        | 0.018        | 0.004        | < 0.002          | 0.027            |
| AUG 15,84       | JUL 18,84        | 0.006            | < 0.001        | 0.006        | 0.053        | 0.003        | < 0.002          | 0.043            |
| SEP 11,84       | AUG 15,84        | 0.003            | < 0.001        | 0.014        | 0.059        | 0.005        | < 0.002          | 0.081            |
| OCT 10,84       | SEP 11,84        | < 0.001          | < 0.010        | < 0.003      | D 0.012      | 0.002        | < 0.002          | 0.009            |
| NOV 7,84        | OCT 10,84        | 0.002            | < 0.001        | 0.003        | 0.015        | 0.002        | < 0.002          | 0.013            |
| DEC 4,84        | NOV 7,84         | 0.001            | 0.000          | 0.006        | 0.018        | 0.004        | < 0.000          | 0.018            |
| JAN 10,85       | DEC 4,84         | < 0.001          | 0.000          | 0.004        | 0.021        | 0.004        | < 0.000          | 0.016            |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

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STATION NAME : AZURE LAKE/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | COPPER<br>MG/L | CADMIUM<br>MG/L | FREE H+<br>MG/L |
|-----------------|------------------|----------------|-----------------|-----------------|
| FEB 1,84        | JAN 9,84         | 0.004          | 0.0001          | 0.0562          |
| MAR 28,84       | MAR 5,84         | 0.002          | 0.0001          | 0.1023          |
| APR 24,84       | MAR 28,84        | 0.003          | 0.0003          | 0.0295          |
| MAY 22,84       | APR 24,84        | 0.002          | < 0.0001        | 0.0389          |
| JUN 21,84       | MAY 22,84        | 0.001          | 0.0001          | 0.0309          |
| JUL 18,84       | JUN 21,84        | < 0.002        | 0.0001          | 0.0229          |
| AUG 15,84       | JUL 18,84        | < 0.002        | 0.0001          | 0.0389          |
| SEP 11,84       | AUG 15,84        | 0.004          | 0.0001          | 0.0178          |
| OCT 10,84       | SEP 11,84        | < 0.001        | 0.0001          | 0.0263          |
| NOV 7,84        | OCT 10,84        | 0.001          | 0.0002          | 0.0302          |
| DEC 4,84        | NOV 7,84         | 0.001          | 0.0001          | 0.0269          |
| JAN 10,85       | DEC 4,84         | 0.001          | < 0.0000        | 0.0257          |

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ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : BEAR ISLAND/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | SAMPLING<br>START<br>HR. | END<br>HR. | SAMPLE<br>TYPE<br>01-RAIN<br>02-SNOW<br>03-COMP/04-OTHER | GAUGE<br>DEPTH(MM) | GAUGE<br>TYPE<br>00-APIOS<br>09-AES | SAMPLE<br>NUMBER | PROJECT<br>CODE<br>02-APIOS<br>03-SPECIAL | SUBPROJECT<br>CODE<br>01-MOE<br>03-AES | SAMPLER<br>EFFICI-<br>ENCY<br>(%) | COMMENTS<br>FIELD OFFICE |
|-----------------|------------------|--------------------------|------------|--|--------------------|-------------------------------------|------------------|---|--|-----------------------------------|--------------------------|
| JAN 31,84       | JAN 3,84         | 1615                     | 1341       | 2  | 17.5               | 0                                   | 11780            | 2   | 1                                      | U 96                              | F                        |
| MAR 27,84       | FEB 28,84        | 1713                     | 1020       | 4  | 13.7               | 0                                   | 11806            | 2   | 1                                      | 84                                |                          |
| APR 24,84       | MAR 27,84        | 1025                     | 1339       | 1  | 38.4               | 9                                   | 11828            | 2   | 1                                      | 117                               | CDG                      |
| MAY 22,84       | APR 24,84        | 1349                     | 1705       | 1  | 54.0               | 9                                   | 11847            | 2   | 1                                      | 61                                | ACDIF M                  |
| JUN 19,84       | MAY 22,84        | 1705                     | 1655       | 1  | 89.0               | 0                                   | 11857            | 2   | 1                                      | 79                                | ABC                      |
| JUL 17,84       | JUN 19,84        | 1655                     | 1657       | 1  | 159.1              | 9                                   | 11858            | 2   | 1                                      | 60                                | ABCDG                    |
| AUG 14,84       | JUL 17,84        | 1658                     | 935        | 1  | 58.0               | 0                                   | 11880            | 2   | 1                                      | 85                                |                          |
| SEP 11,84       | AUG 14,84        | 935                      | 800        | 1  | 53.0               | 0                                   | 35228            | 2   | 1                                      | 83                                | BD                       |
| OCT 12,84       | SEP 11,84        | 1158                     | 958        | 1  | 54.0               | 0                                   | 35250            | 2   | 1                                      | 98                                | ABCD                     |
| NOV 7,84        | OCT 12,84        | 958                      | 1621       | 3  | 55.0               | 0                                   | 35261            | 2   | 1                                      | 113                               | BCD                      |
| DEC 4,84        | NOV 7,84         | 1630                     | 1640       | 2  | 62.0               | 0                                   | 35313            | 2   | 1                                      | 0                                 | E                        |
| JAN 2,85        | DEC 4,84         | 1640                     | 1015       | 3  | 85.0               | 0                                   | 35312            | 2   | 1                                      | 61                                |                          |

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | VOLUME<br>ML | CONDUCT.<br>UMHO/CM | PH<br>LAB | TOTAL H+<br>TO PH8.3<br>MG/L | SULPHATE<br>MG/L | NITRATE<br>AS N<br>MG/L | CALCIUM<br>MG/L |
|-----------------|------------------|--------------|---------------------|-----------|------------------------------|------------------|-------------------------|-----------------|
| JAN 31,84       | JAN 3,84         | 550.0        | 25.1                | 4.24      | 0.0762                       | 0.95             | 0.63                    | 0.05            |
| MAR 27,84       | FEB 28,84        | 375.0        | 46.5                | 4.04      | 0.1238                       | 3.90             | 0.74                    | 0.31            |
| APR 24,84       | MAR 27,84        | 1469.0       | 10.4                | 4.69      | 0.0434                       | 1.05             | 0.08                    | 0.19            |
| MAY 22,84       | APR 24,84        | 1072.0       | 38.8                | U 7.34    | 0.0426                       | 5.00             | 0.40                    | 0.51            |
| JUN 19,84       | MAY 22,84        | 2300.0       | 30.5                | 4.18      | 0.0878                       | 3.65             | 0.45                    | 0.30            |
| JUL 17,84       | JUN 19,84        | 3133.0       | 20.6                | 4.52      | 0.0566                       | 3.35             | 0.28                    | 0.17            |
| AUG 14,84       | JUL 17,84        | 1605.0       | 26.5                | D 4.32    | 0.0682                       | 3.15             | 0.23                    | 0.10            |
| SEP 11,84       | AUG 14,84        | 1441.0       | 39.3                | 4.12      | 0.1056                       | 4.30             | 0.46                    | 0.25            |
| OCT 12,84       | SEP 11,84        | 1725.0       | 33.7                | 4.28      | 0.0892                       | 3.75             | 0.44                    | 0.38            |
| NOV 7,84        | OCT 12,84        | 2035.0       | 27.0                | 4.31      | 0.0686                       | 2.55             | 0.36                    | 0.12            |
| DEC 4,84        | NOV 7,84         | 0.0          | *****               | *****     | *****                        | *****            | *****                   | *****           |
| JAN 2,85        | DEC 4,84         | 1692.0       | 22.7                | 4.35      | *****                        | 1.45             | 0.39                    | 0.07            |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : BEAR ISLAND/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | CHLORIDE<br>MG/L | KJELDAHL<br>AS N<br>MG/L | MAGNESIM<br>MG/L | POTASSIM<br>MG/L | SODIUM<br>MG/L | AMMONIUM<br>AS N<br>MG/L | PHOSPHOR<br>MG/L |
|-----------------|------------------|------------------|--------------------------|------------------|------------------|----------------|--------------------------|------------------|
| JAN 31,84       | JAN 3,84         | 0.14             | 0.20                     | 0.010            | <T 0.005         | 0.045          | 0.072                    | 0.010            |
| MAR 27,84       | FEB 28,84        | 0.27             | *****                    | 0.045            | 0.035            | 0.175          | 0.226                    | *****            |
| APR 24,84       | MAR 27,84        | 0.08             | 0.12                     | 0.025            | 0.020            | 0.030          | 0.040                    | <T 0.004         |
| MAY 22,84       | APR 24,84        | 0.31             | U 6.00                   | 0.090            | U 0.585          | U 0.425        | U 3.600                  | U 0.455          |
| JUN 19,84       | MAY 22,84        | 0.10             | 0.58                     | 0.050            | 0.020            | 0.015          | 0.315                    | 0.012            |
| JUL 17,84       | JUN 19,84        | 0.18             | 1.07                     | 0.035            | 0.125            | 0.080          | 0.670                    | 0.090            |
| AUG 14,84       | JUL 17,84        | 0.13             | 0.54                     | 0.030            | 0.080            | 0.165          | 0.360                    | 0.013            |
| SEP 11,84       | AUG 14,84        | 0.22             | 0.57                     | 0.035            | D 0.210          | D 0.110        | 0.345                    | 0.018            |
| OCT 12,84       | SEP 11,84        | 0.19             | 0.57                     | 0.065            | 0.255            | 0.160          | 0.350                    | 0.026            |
| NOV 7,84        | OCT 12,84        | 0.09             | 0.26                     | 0.030            | 0.325            | 0.020          | 0.195                    | 0.009            |
| DEC 4,84        | NOV 7,84         | *****            | *****                    | *****            | *****            | *****          | *****                    | *****            |
| JAN 2,85        | DEC 4,84         | 0.14             | 0.13                     | <T 0.010         | 0.030            | 0.050          | 0.060                    | 0.005            |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | MANGANSE<br>MG/L | NICKEL<br>MG/L | ZINC<br>MG/L | IRON<br>MG/L | LEAD<br>MG/L | VANADIUM<br>MG/L | ALUMINUM<br>MG/L |
|-----------------|------------------|------------------|----------------|--------------|--------------|--------------|------------------|------------------|
| JAN 31,84       | JAN 3,84         | 0.001            | 0.002          | 0.005        | 0.015        | 0.008        | < 0.002          | 0.049            |
| MAR 27,84       | FEB 28,84        | 0.003            | 0.003          | 0.010        | 0.061        | 0.010        | < 0.002          | 0.074            |
| APR 24,84       | MAR 27,84        | < 0.001          | < 0.001        | 0.003        | 0.009        | 0.013        | < 0.002          | 0.008            |
| MAY 22,84       | APR 24,84        | 0.006            | < 0.001        | G 0.028      | G 0.208      | 0.013        | < 0.002          | G 0.236          |
| JUN 19,84       | MAY 22,84        | 0.003            | < 0.001        | 0.003        | 0.032        | 0.008        | < 0.002          | 0.029            |
| JUL 17,84       | JUN 19,84        | 0.002            | < 0.001        | 0.006        | 0.042        | 0.009        | < 0.002          | 0.038            |
| AUG 14,84       | JUL 17,84        | 0.002            | < 0.001        | 0.007        | 0.027        | 0.007        | < 0.002          | 0.021            |
| SEP 11,84       | AUG 14,84        | 0.003            | < 0.001        | 0.007        | 0.033        | 0.007        | < 0.002          | 0.037            |
| OCT 12,84       | SEP 11,84        | 0.003            | < 0.001        | 0.007        | 0.018        | 0.005        | < 0.002          | 0.022            |
| NOV 7,84        | OCT 12,84        | 0.002            | < 0.001        | 0.004        | 0.012        | 0.004        | < 0.002          | 0.013            |
| DEC 4,84        | NOV 7,84         | *****            | *****          | *****        | *****        | *****        | *****            | *****            |
| JAN 2,85        | DEC 4,84         | 0.001            | 0.001          | 0.005        | 0.032        | 0.007        | < 0.000          | 0.030            |

ONTARIO MINISTRY OF THE ENVIRONMENT  
 CUMULATIVE SAMPLING ANALYSIS RESULTS  
 APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

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STATION NAME : BEAR ISLAND/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | COPPER<br>MG/L | CADMIUM<br>MG/L | FREE H+<br>MG/L |
|-----------------|------------------|----------------|-----------------|-----------------|
| JAN 31,84       | JAN 3,84         | 0.003          | 0.0002          | 0.0575          |
| MAR 27,84       | FEB 28,84        | 0.003          | 0.0001          | 0.0912          |
| APR 24,84       | MAR 27,84        | 0.001          | < 0.0001        | 0.0204          |
| MAY 22,84       | APR 24,84        | 0.004          | 0.0004          | U 0.0000        |
| JUN 19,84       | MAY 22,84        | < 0.001        | 0.0001          | 0.0661          |
| JUL 17,84       | JUN 19,84        | 0.004          | 0.0002          | 0.0302          |
| AUG 14,84       | JUL 17,84        | 0.002          | 0.0005          | D 0.0479        |
| SEP 11,84       | AUG 14,84        | 0.002          | 0.0010          | 0.0759          |
| OCT 12,84       | SEP 11,84        | 0.003          | 0.0002          | 0.0525          |
| NOV 7,84        | OCT 12,84        | 0.001          | 0.0002          | 0.0490          |
| DEC 4,84        | NOV 7,84         | *****          | *****           | *****           |
| JAN 2,85        | DEC 4,84         | 0.001          | 0.0001          | 0.0447          |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : GOWGANDA/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | SAMPLING<br>START<br>HR. | END<br>HR. | SAMPLE<br>TYPE<br>01-RAIN<br>02-SNOW<br>03-COMP/04-OTHER | GAUGE<br>DEPTH(MM) | GAUGE<br>TYPE<br>00-APIOS<br>09-AES | SAMPLE<br>NUMBER | PROJECT<br>CODE<br>02-APIOS<br>03-SPECIAL | SUBPROJECT<br>CODE<br>01-MOE<br>03-AES | SAMPLER<br>EFFICI-<br>ENCY<br>(%) | COMMENTS<br>FIELD OFFICE |
|-----------------|------------------|--------------------------|------------|--|--------------------|-------------------------------------|------------------|---|--|-----------------------------------|--------------------------|
| JAN 31,84       | JAN 3,84         | 1300                     | 1045       | 2  | 12.2               | 0                                   | 11781            | 2   | 1                                      | 58                                |                          |
| FEB 28,84       | JAN 31,84        | 1045                     | 857        | 2  | 34.5               | 0                                   | 11799            | 2   | 1                                      | U 63                              | G M                      |
| MAR 27,84       | FEB 28,84        | 857                      | 952        | 4  | 14.8               | 0                                   | 11805            | 2   | 1                                      | 54                                |                          |
| APR 24,84       | MAR 27,84        | 952                      | 915        | 1  | 27.9               | 0                                   | 11837            | 2   | 1                                      | 95                                | D                        |
| MAY 22,84       | APR 24,84        | 915                      | 1200       | 1  | 47.6               | 0                                   | 11838            | 2   | 1                                      | U 59                              | CDF                      |
| JUN 19,84       | MAY 22,84        | 1200                     | 930        | 1  | 111.0              | 0                                   | 11867            | 2   | 1                                      | U 99                              | GD                       |
| JUL 17,84       | JUN 19,84        | 930                      | 925        | 1  | 141.0              | 0                                   | 11868            | 2   | 1                                      | U 11                              | CDG HM                   |
| AUG 14,84       | JUL 17,84        | 925                      | 1700       | 1  | 84.0               | 0                                   | 35226            | 2   | 1                                      | U 86                              | ADG                      |
| SEP 11,84       | AUG 14,84        | 1700                     | 1015       | 1  | 55.0               | 0                                   | 35227            | 2   | 1                                      | U 90                              | CG                       |
| OCT 9,84        | SEP 11,84        | 1015                     | 1000       | 1  | 72.1               | 9                                   | 35293            | 2   | 1                                      | ***                               | E                        |
| NOV 6,84        | OCT 9,84         | 1000                     | 1450       | 2  | 75.4               | 9                                   | 35294            | 2   | 1                                      | 0                                 | E                        |
| DEC 4,84        | NOV 6,84         | 1450                     | 1630       | 3  | 53.2               | 9                                   | 35288            | 2   | 1                                      | 3                                 | E                        |
| JAN 2,85        | DEC 4,84         | 1630                     | 1137       | 3  | 59.0               | 0                                   | 35311            | 2   | 1                                      | U 20                              | G                        |

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | VOLUME<br>ML | CONDUCT.<br>UMHO/CM | PH<br>LAB | TOTAL H+<br>TO PH8.3<br>MG/L | SULPHATE<br>MG/L | NITRATE<br>AS N<br>MG/L | CALCIUM<br>MG/L |
|-----------------|------------------|--------------|---------------------|-----------|------------------------------|------------------|-------------------------|-----------------|
| JAN 31,84       | JAN 3,84         | 230.0        | 25.7                | 4.24      | 0.0818                       | 1.40             | 0.55                    | 0.13            |
| FEB 28,84       | JAN 31,84        | 708.0        | 31.0                | 4.25      | 0.0976                       | 2.30             | 0.42                    | 0.11            |
| MAR 27,84       | FEB 28,84        | 262.0        | 48.5                | 4.05      | 0.1310                       | 4.95             | 0.62                    | G 0.41          |
| APR 24,84       | MAR 27,84        | 863.0        | 10.6                | 4.66      | 0.0432                       | 0.95             | 0.07                    | 0.05            |
| MAY 22,84       | APR 24,84        | 914.0        | 33.6                | 4.29      | 0.0862                       | 4.35             | 0.52                    | 0.50            |
| JUN 19,84       | MAY 22,84        | 3574.0       | 18.0                | 4.49      | 0.0530                       | 2.45             | 0.24                    | 0.15            |
| JUL 17,84       | JUN 19,84        | 538.0        | 19.5                | U 6.51    | 0.0222                       | 3.35             | 0.12                    | D 0.42          |
| AUG 14,84       | JUL 17,84        | 2370.0       | 9.5                 | 4.90      | 0.0344                       | 1.05             | 0.10                    | 0.07            |
| SEP 11,84       | AUG 14,84        | 1609.0       | 22.6                | 4.35      | 0.0680                       | 2.30             | 0.24                    | 0.18            |
| OCT 9,84        | SEP 11,84        | *****        | *****               | *****     | *****                        | *****            | *****                   | *****           |
| NOV 6,84        | OCT 9,84         | 0.0          | *****               | *****     | *****                        | *****            | *****                   | *****           |
| DEC 4,84        | NOV 6,84         | 61.0         | 29.1                | 4.33      | 0.0772                       | 2.25             | 0.54                    | *****           |
| JAN 2,85        | DEC 4,84         | 399.0        | 18.8                | 4.46      | *****                        | 1.40             | 0.27                    | 0.08            |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : GOWGANDA/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | CHLORIDE<br>MG/L | KJELDAHL<br>AS N<br>MG/L | MAGNESIM<br>MG/L | POTASSIM<br>MG/L | SODIUM<br>MG/L | AMMONIUM<br>AS N<br>MG/L | PHOSPHOR<br>MG/L |
|-----------------|------------------|------------------|--------------------------|------------------|------------------|----------------|--------------------------|------------------|
| JAN 31,84       | JAN 3,84         | 0.15             | *****                    | 0.030            | <T 0.005         | 0.080          | <T 0.002                 | *****            |
| FEB 28,84       | JAN 31,84        | 0.17             | 0.26                     | <W 0.005         | <T 0.005         | 0.070          | 0.002                    | 0.012            |
| MAR 27,84       | FEB 28,84        | 0.33             | 0.51                     | 0.080            | 0.060            | G 0.230        | 0.282                    | 0.021            |
| APR 24,84       | MAR 27,84        | 0.05             | 0.12                     | 0.005            | <T 0.010         | <T 0.010       | <W 0.005                 | <T 0.004         |
| MAY 22,84       | APR 24,84        | 0.16             | 0.90                     | 0.085            | 0.075            | 0.070          | 0.575                    | G 0.139          |
| JUN 19,84       | MAY 22,84        | 0.13             | 0.56                     | 0.025            | 0.095            | 0.050          | 0.345                    | 0.024            |
| JUL 17,84       | JUN 19,84        | U 1.40           | U 2.75                   | D 0.080          | U 1.250          | U 1.290        | D 0.740                  | D 0.047          |
| AUG 14,84       | JUL 17,84        | 0.11             | 0.34                     | 0.010            | 0.050            | 0.025          | 0.130                    | 0.022            |
| SEP 11,84       | AUG 14,84        | 0.11             | 0.26                     | 0.020            | <T 0.010         | 0.025          | 0.140                    | 0.011            |
| OCT 9,84        | SEP 11,84        | *****            | *****                    | *****            | *****            | *****          | *****                    | *****            |
| NOV 6,84        | OCT 9,84         | *****            | *****                    | *****            | *****            | *****          | *****                    | *****            |
| DEC 4,84        | NOV 6,84         | 0.26             | *****                    | *****            | *****            | *****          | 0.240                    | *****            |
| JAN 2,85        | DEC 4,84         | 0.17             | 0.13                     | <T 0.015         | <T 0.020         | 0.080          | 0.085                    | <T 0.004         |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | MANGANESE<br>MG/L | NICKEL<br>MG/L | ZINC<br>MG/L | IRON<br>MG/L | LEAD<br>MG/L | VANADIUM<br>MG/L | ALUMINUM<br>MG/L |
|-----------------|------------------|-------------------|----------------|--------------|--------------|--------------|------------------|------------------|
| JAN 31,84       | JAN 3,84         | 0.003             | 0.002          | 0.011        | 0.024        | 0.012        | < 0.002          | 0.052            |
| FEB 28,84       | JAN 31,84        | 0.001             | < 0.001        | 0.007        | 0.019        | 0.007        | < 0.002          | 0.053            |
| MAR 27,84       | FEB 28,84        | 0.008             | 0.005          | G 0.041      | B 0.138      | 0.013        | < 0.002          | 0.125            |
| APR 24,84       | MAR 27,84        | 0.001             | < 0.001        | 0.003        | 0.028        | 0.006        | < 0.002          | 0.031            |
| MAY 22,84       | APR 24,84        | 0.009             | 0.002          | 0.007        | G 0.227      | 0.011        | < 0.002          | G 0.337          |
| JUN 19,84       | MAY 22,84        | 0.004             | < 0.001        | 0.003        | 0.023        | 0.007        | < 0.002          | 0.035            |
| JUL 17,84       | JUN 19,84        | 0.008             | 0.005          | U 0.084      | B 0.119      | 0.013        | < 0.002          | 0.066            |
| AUG 14,84       | JUL 17,84        | 0.001             | < 0.001        | 0.002        | 0.010        | 0.003        | < 0.002          | 0.014            |
| SEP 11,84       | AUG 14,84        | 0.002             | < 0.001        | 0.004        | 0.052        | 0.006        | < 0.002          | 0.085            |
| OCT 9,84        | SEP 11,84        | *****             | *****          | *****        | *****        | *****        | *****            | *****            |
| NOV 6,84        | OCT 9,84         | *****             | *****          | *****        | *****        | *****        | *****            | *****            |
| DEC 4,84        | NOV 6,84         | *****             | *****          | *****        | *****        | *****        | *****            | *****            |
| JAN 2,85        | DEC 4,84         | 0.001             | 0.000          | 0.007        | 0.019        | 0.004        | < 0.000          | 0.047            |

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ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

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STATION NAME : GOWGANDA/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | COPPER<br>MG/L | CADMIUM<br>MG/L | FREE H+<br>MG/L |
|-----------------|------------------|----------------|-----------------|-----------------|
| JAN 31,84       | JAN 3,84         | 0.007          | 0.0003          | 0.0575          |
| FEB 28,84       | JAN 31,84        | 0.002          | < 0.0001        | 0.0562          |
| MAR 27,84       | FEB 28,84        | 0.007          | 0.0003          | 0.0891          |
| APR 24,84       | MAR 27,84        | 0.002          | < 0.0001        | 0.0219          |
| MAY 22,84       | APR 24,84        | 0.005          | < 0.0001        | 0.0513          |
| JUN 19,84       | MAY 22,84        | < 0.001        | 0.0001          | 0.0324          |
| JUL 17,84       | JUN 19,84        | U 0.023        | U 0.0064        | U 0.0003        |
| AUG 14,84       | JUL 17,84        | < 0.001        | 0.0001          | 0.0126          |
| SEP 11,84       | AUG 14,84        | < 0.002        | 0.0001          | 0.0447          |
| OCT 9,84        | SEP 11,84        | *****          | *****           | *****           |
| NOV 6,84        | OCT 9,84         | *****          | *****           | *****           |
| DEC 4,84        | NOV 6,84         | *****          | *****           | 0.0468          |
| JAN 2,85        | DEC 4,84         | 0.002          | 0.0001          | 0.0347          |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : KILLARNEY/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | SAMPLING<br>START<br>HR. | END<br>HR. | SAMPLE<br>TYPE<br>01-RAIN<br>02-SNOW<br>03-COMP/04-OTHER | GAUGE<br>DEPTH(MM) | GAUGE<br>TYPE<br>00-APIOS<br>09-AES | SAMPLE<br>NUMBER | PROJECT<br>CODE<br>02-APIOS<br>03-SPECIAL | SUBPROJECT<br>CODE<br>01-MOE<br>03-AES | SAMPLER<br>EFFICI-<br>ENCY<br>(%) | COMMENTS<br>FIELD OFFICE |
|-----------------|------------------|--------------------------|------------|--|--------------------|-------------------------------------|------------------|---|--|-----------------------------------|--------------------------|
| FEB 10,84       | JAN 3,84         | 1600                     | 1600       | 2  | 53.9               | 0                                   | 11778            | 2   | 1                                      | 69                                |                          |
| FEB 28,84       | FEB 10,84        | 1600                     | 1330       | 2  | 20.8               | 0                                   | 11796            | 2   | 1                                      | 58                                |                          |
| MAR 27,84       | FEB 28,84        | 1330                     | 1700       | 3  | 70.2               | 0                                   | 11811            | 2   | 1                                      | 72                                |                          |
| APR 24,84       | MAR 27,84        | 1700                     | 1100       | 1  | 50.9               | 0                                   | 11821            | 2   | 1                                      | 82                                |                          |
| MAY 29,84       | APR 24,84        | 1100                     | 1235       | 1  | 86.5               | 9                                   | 11835            | 2   | 1                                      | 73                                | CD N                     |
| JUN 19,84       | MAY 29,84        | 1235                     | 1125       | 1  | 103.1              | 9                                   | 11849            | 2   | 1                                      | 59                                | AC                       |
| JUL 17,84       | JUN 19,84        | 1125                     | 900        | 1  | 74.0               | 0                                   | 11855            | 2   | 1                                      | 72                                | CDG                      |
| AUG 15,84       | JUL 17,84        | 900                      | 1335       | 1  | 65.0               | 0                                   | 11872            | 2   | 1                                      | 68                                | CD                       |
| SEP 11,84       | AUG 15,84        | 1335                     | 830        | 1  | 124.0              | 0                                   | 35217            | 2   | 1                                      | 82                                |                          |
| OCT 16,84       | SEP 11,84        | 830                      | 1145       | 1  | 79.9               | 9                                   | 35249            | 2   | 1                                      | 79                                | CD                       |
| NOV 6,84        | OCT 16,84        | 1145                     | 1030       | 1  | 97.2               | 9                                   | 35257            | 2   | 1                                      | 91                                | CD                       |
| DEC 6,84        | NOV 6,84         | 1030                     | 1130       | 3  | 82.5               | 9                                   | 35273            | 2   | 1                                      | 69                                | N                        |
| JAN 2,85        | DEC 6,84         | 1130                     | 1000       | 2  | 123.0              | 0                                   | 35306            | 2   | 1                                      | 49                                | G                        |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | VOLUME<br>ML | CONDUCT.<br>UMHO/CM | PH<br>LAB | TOTAL H+<br>TO PH8.3<br>MG/L | SULPHATE<br>MG/L | NITRATE<br>AS N<br>MG/L | CALCIUM<br>MG/L |
|-----------------|------------------|--------------|---------------------|-----------|------------------------------|------------------|-------------------------|-----------------|
| FEB 10,84       | JAN 3,84         | 1223.0       | 45.0                | 4.06      | 0.1256                       | 2.15             | 1.17                    | 0.19            |
| FEB 28,84       | FEB 10,84        | 398.0        | G 100.0             | 3.62      | G 0.2760                     | G 6.90           | G 2.37                  | 0.28            |
| MAR 27,84       | FEB 28,84        | 1663.0       | 50.0                | 4.04      | 0.1340                       | 4.30             | 0.78                    | 0.25            |
| APR 24,84       | MAR 27,84        | 1362.0       | 18.8                | 4.50      | 0.0574                       | 2.00             | 0.18                    | 0.26            |
| MAY 29,84       | APR 24,84        | 2064.0       | 32.3                | 4.29      | 0.0790                       | 3.85             | 0.54                    | 0.41            |
| JUN 19,84       | MAY 29,84        | 2003.0       | 43.0                | 4.13      | 0.1068                       | 5.25             | 0.64                    | 0.38            |
| JUL 17,84       | JUN 19,84        | 1731.0       | 28.5                | U 6.84    | 0.0410                       | 4.60             | B 1.43                  | U 0.69          |
| AUG 15,84       | JUL 17,84        | 1444.0       | 44.0                | 4.09      | 0.1052                       | 4.85             | 0.56                    | 0.25            |
| SEP 11,84       | AUG 15,84        | 3331.0       | 29.5                | 4.26      | 0.0816                       | 2.90             | 0.35                    | 0.10            |
| OCT 16,84       | SEP 11,84        | 2075.0       | 38.1                | 4.20      | 0.0928                       | 3.85             | 0.60                    | 0.24            |
| NOV 6,84        | OCT 16,84        | 2890.0       | 35.0                | 4.20      | 0.0878                       | 3.00             | 0.53                    | 0.12            |
| DEC 6,84        | NOV 6,84         | 1851.0       | 34.2                | 4.24      | 0.0868                       | 2.25             | 0.75                    | 0.24            |
| JAN 2,85        | DEC 6,84         | 1984.0       | 21.4                | 4.41      | *****                        | 1.60             | 0.39                    | 0.12            |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : KILLARNEY/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | CHLORIDE<br>MG/L | KJELDAHL<br>AS N<br>MG/L | MAGNESIM<br>MG/L | POTASSIM<br>MG/L | SODIUM<br>MG/L | AMMONIUM<br>AS N<br>MG/L | PHOSPHOR<br>MG/L |
|-----------------|------------------|------------------|--------------------------|------------------|------------------|----------------|--------------------------|------------------|
| FEB 10,84       | JAN 3,84         | 0.24             | 0.54                     | 0.010            | 0.025            | 0.100          | 0.450                    | 0.006            |
| FEB 28,84       | FEB 10,84        | G 0.44           | G 1.14                   | 0.045            | 0.050            | 0.075          | 1.110                    | 0.016            |
| MAR 27,84       | FEB 28,84        | 0.22             | 0.42                     | 0.040            | 0.025            | 0.090          | 0.336                    | 0.008            |
| APR 24,84       | MAR 27,84        | 0.11             | 0.15                     | 0.070            | 0.035            | 0.045          | 0.130                    | 0.009            |
| MAY 29,84       | APR 24,84        | 0.24             | 0.85                     | 0.065            | 0.075            | 0.045          | 0.530                    | 0.035            |
| JUN 19,84       | MAY 29,84        | 0.28             | 1.01                     | 0.080            | *****            | 0.145          | 0.795                    | 0.050            |
| JUL 17,84       | JUN 19,84        | 0.22             | U 3.20                   | U 0.180          | U 0.605          | 0.065          | U 2.900                  | U 0.360          |
| AUG 15,84       | JUL 17,84        | 0.12             | 0.77                     | 0.060            | 0.040            | 0.030          | 0.605                    | 0.007            |
| SEP 11,84       | AUG 15,84        | 0.11             | 0.42                     | 0.010            | 0.010            | 0.020          | 0.320                    | 0.005            |
| OCT 16,84       | SEP 11,84        | 0.14             | 0.62                     | 0.030            | 0.040            | 0.050          | 0.570                    | <T 0.003         |
| NOV 6,84        | OCT 16,84        | 0.12             | 0.40                     | 0.025            | 0.060            | 0.020          | 0.360                    | <T 0.002         |
| DEC 6,84        | NOV 6,84         | 0.18             | 0.36                     | 0.030            | <W 0.005         | 0.060          | 0.330                    | <T 0.003         |
| JAN 2,85        | DEC 6,84         | 0.14             | 0.24                     | <T 0.015         | <T 0.015         | 0.065          | 0.185                    | 0.006            |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | MANGANSE<br>MG/L | NICKEL<br>MG/L | ZINC<br>MG/L | IRON<br>MG/L | LEAD<br>MG/L | VANADIUM<br>MG/L | ALUMINUM<br>MG/L |
|-----------------|------------------|------------------|----------------|--------------|--------------|--------------|------------------|------------------|
| FEB 10,84       | JAN 3,84         | 0.003            | U 0.072        | 0.014        | 0.035        | 0.010        | < 0.002          | 0.020            |
| FEB 28,84       | FEB 10,84        | 0.006            | < 0.001        | 0.021        | 0.080        | 0.027        | < 0.002          | 0.112            |
| MAR 27,84       | FEB 28,84        | 0.004            | < 0.001        | 0.008        | 0.065        | 0.008        | < 0.002          | 0.060            |
| APR 24,84       | MAR 27,84        | 0.001            | < 0.001        | 0.004        | 0.016        | 0.003        | < 0.002          | 0.024            |
| MAY 29,84       | APR 24,84        | 0.006            | < 0.001        | 0.006        | 0.058        | 0.005        | < 0.002          | 0.058            |
| JUN 19,84       | MAY 29,84        | 0.006            | < 0.001        | 0.007        | 0.059        | 0.010        | < 0.002          | 0.072            |
| JUL 17,84       | JUN 19,84        | 0.005            | < 0.001        | 0.015        | 0.053        | 0.006        | < 0.002          | 0.046            |
| AUG 15,84       | JUL 17,84        | 0.003            | < 0.001        | 0.006        | 0.028        | 0.007        | < 0.002          | 0.026            |
| SEP 11,84       | AUG 15,84        | 0.002            | < 0.001        | L 0.007      | L 0.009      | L 0.004      | < 0.002          | L 0.013          |
| OCT 16,84       | SEP 11,84        | 0.002            | < 0.001        | 0.009        | 0.012        | 0.007        | < 0.002          | 0.018            |
| NOV 6,84        | OCT 16,84        | 0.001            | < 0.001        | 0.005        | 0.014        | 0.007        | < 0.002          | 0.015            |
| DEC 6,84        | NOV 6,84         | 0.002            | 0.001          | 0.008        | 0.081        | 0.009        | < 0.000          | 0.045            |
| JAN 2,85        | DEC 6,84         | 0.001            | 0.001          | 0.006        | 0.016        | 0.005        | < 0.000          | 0.021            |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

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STATION NAME : KILLARNEY/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | COPPER<br>MG/L | CADMIUM<br>MG/L | FREE H+<br>MG/L |
|-----------------|------------------|----------------|-----------------|-----------------|
| FEB 10,84       | JAN 3,84         | 0.002          | 0.0002          | 0.0871          |
| FEB 28,84       | FEB 10,84        | 0.003          | 0.0004          | 0.2399          |
| MAR 27,84       | FEB 28,84        | 0.001          | 0.0001          | 0.0912          |
| APR 24,84       | MAR 27,84        | 0.002          | 0.0002          | 0.0316          |
| MAY 29,84       | APR 24,84        | 0.001          | < 0.0001        | 0.0513          |
| JUN 19,84       | MAY 29,84        | 0.003          | 0.0002          | 0.0741          |
| JUL 17,84       | JUN 19,84        | 0.001          | 0.0001          | U 0.0001        |
| AUG 15,84       | JUL 17,84        | 0.001          | < 0.0001        | 0.0813          |
| SEP 11,84       | AUG 15,84        | L< 0.001       | 0.0001          | 0.0550          |
| OCT 16,84       | SEP 11,84        | 0.001          | 0.0002          | 0.0631          |
| NOV 6,84        | OCT 16,84        | 0.002          | 0.0001          | 0.0631          |
| DEC 6,84        | NOV 6,84         | 0.002          | 0.0001          | 0.0575          |
| JAN 2,85        | DEC 6,84         | 0.002          | 0.0000          | 0.0389          |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : MATTAWA/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | SAMPLING<br>START<br>HR. | SAMPLING<br>END<br>HR. | SAMPLE<br>TYPE<br>01-RAIN<br>02-SNOW<br>03-COMP/04-OTHER | GAUGE<br>DEPTH(MM) | GAUGE<br>TYPE<br>00-APIOS<br>09-AES | SAMPLE<br>NUMBER | PROJECT<br>CODE<br>02-APIOS<br>03-SPECIAL | SUBPROJECT<br>CODE<br>01-MOE<br>03-AES | SAMPLER<br>EFFICI-<br>ENCY<br>(%) | COMMENTS<br>FIELD OFFICE |
|-----------------|------------------|--------------------------|------------------------|--|--------------------|-------------------------------------|------------------|---|--|-----------------------------------|--------------------------|
| FEB 2,84        | JAN 4,84         | 1420                     | 1130                   | 2  | 17.7               | 0                                   | 11779            | 2   | 1                                      | 33                                | N                        |
| FEB 28,84       | FEB 2,84         | 1130                     | 730                    | 3  | 54.6               | 0                                   | 11797            | 2   | 1                                      | 70                                | C                        |
| MAR 27,84       | FEB 28,84        | 730                      | 1630                   | 3  | 40.7               | 9                                   | 11810            | 2   | 1                                      | 67                                | C                        |
| APR 24,84       | MAR 27,84        | 1630                     | 1820                   | 1  | 46.9               | 0                                   | 11823            | 2   | 1                                      | 97                                | C                        |
| MAY 23,84       | APR 24,84        | 1820                     | 730                    | 1  | 42.7               | 9                                   | 11839            | 2   | 1                                      | 95                                | MI                       |
| JUN 19,84       | MAY 23,84        | 730                      | 1400                   | 1  | 113.2              | 0                                   | 11845            | 2   | 1                                      | U 86                              | GA                       |
| JUL 19,84       | JUN 19,84        | 1400                     | 945                    | 1  | 145.0              | 0                                   | 11860            | 2   | 1                                      | 83                                | CD C                     |
| AUG 14,84       | JUL 19,84        | 945                      | 1240                   | 1  | 75.0               | 0                                   | 11875            | 2   | 1                                      | 47                                | CD N                     |
| SEP 11,84       | AUG 14,84        | 1240                     | 1145                   | 1  | 81.0               | 0                                   | 35213            | 2   | 1                                      | 85                                | A                        |
| OCT 9,84        | SEP 11,84        | 1145                     | 1330                   | 1  | 76.0               | 0                                   | 35242            | 2   | 1                                      | 89                                | CD                       |
| NOV 6,84        | OCT 9,84         | 1330                     | 1130                   | 1  | 95.0               | 0                                   | 35253            | 2   | 1                                      | 86                                | C                        |
| DEC 10,84       | NOV 6,84         | 1330                     | 1200                   | 3  | 48.0               | 0                                   | 35279            | 2   | 1                                      | 91                                | NM                       |
| JAN 2,85        | DEC 10,84        | 1200                     | 1430                   | 2  | 97.0               | 0                                   | 35304            | 2   | 1                                      | 67                                |                          |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | VOLUME<br>ML | CONDUCT.<br>UMHO/CM | PH<br>LAB | TOTAL H+<br>TO PH8.3<br>MG/L | SULPHATE<br>MG/L | NITRATE<br>AS N<br>MG/L | CALCIUM<br>MG/L |
|-----------------|------------------|--------------|---------------------|-----------|------------------------------|------------------|-------------------------|-----------------|
| FEB 2,84        | JAN 4,84         | 191.0        | 53.5                | 3.99      | 0.1452                       | 2.50             | G 1.40                  | 0.26            |
| FEB 28,84       | FEB 2,84         | 1245.0       | 37.5                | 4.15      | 0.0908                       | 2.50             | 0.76                    | 0.11            |
| MAR 27,84       | FEB 28,84        | 890.0        | 29.3                | 4.36      | 0.0820                       | 2.35             | 0.61                    | 0.34            |
| APR 24,84       | MAR 27,84        | 1479.0       | 12.4                | 4.62      | 0.0472                       | 0.95             | 0.15                    | 0.06            |
| MAY 23,84       | APR 24,84        | 1330.0       | 26.2                | 4.54      | 0.0666                       | 4.30             | 0.41                    | 0.49            |
| JUN 19,84       | MAY 23,84        | 3177.0       | 28.9                | 4.38      | 0.0656                       | 3.15             | 0.35                    | 0.17            |
| JUL 19,84       | JUN 19,84        | 3943.0       | 16.1                | 4.34      | 0.0716                       | 2.25             | 0.26                    | 0.14            |
| AUG 14,84       | JUL 19,84        | 1165.0       | 38.0                | 4.10      | 0.0962                       | 3.55             | 0.45                    | 0.18            |
| SEP 11,84       | AUG 14,84        | 2255.0       | 35.3                | 4.12      | 0.0942                       | 3.45             | 0.38                    | 0.12            |
| OCT 9,84        | SEP 11,84        | 2204.0       | 21.1                | 4.49      | 0.0574                       | 2.15             | 0.31                    | 0.14            |
| NOV 6,84        | OCT 9,84         | 2667.0       | 25.6                | 4.33      | 0.0700                       | 2.25             | 0.37                    | 0.15            |
| DEC 10,84       | NOV 6,84         | 1422.0       | 21.2                | 4.46      | 0.0594                       | 1.40             | 0.40                    | 0.06            |
| JAN 2,85        | DEC 10,84        | 2130.0       | 12.6                | 4.63      | *****                        | 0.85             | 0.19                    | <T 0.03         |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : MATTAWA/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | CHLORIDE<br>MG/L | KJELDAHL<br>AS N<br>MG/L | MAGNESIM<br>MG/L | POTASSIM<br>MG/L | SODIUM<br>MG/L | AMMONIUM<br>AS N<br>MG/L | PHOSPHOR<br>MG/L |
|-----------------|------------------|------------------|--------------------------|------------------|------------------|----------------|--------------------------|------------------|
| FEB 2,84        | JAN 4,84         | U 0.78           | 0.60                     | 0.030            | 0.055            | U 0.590        | 0.330                    | 0.011            |
| FEB 28,84       | FEB 2,84         | 0.17             | 0.38                     | 0.015            | 0.020            | 0.065          | 0.284                    | 0.008            |
| MAR 27,84       | FEB 28,84        | 0.34             | 0.34                     | 0.050            | 0.070            | G 0.245        | 0.142                    | G 0.060          |
| APR 24,84       | MAR 27,84        | 0.03             | 0.13                     | 0.010            | 0.025            | 0.020          | 0.030                    | 0.007            |
| MAY 23,84       | APR 24,84        | 0.19             | 0.76                     | 0.105            | 0.210            | 0.075          | 0.795                    | 0.029            |
| JUN 19,84       | MAY 23,84        | 0.09             | 0.60                     | 0.045            | 0.160            | 0.075          | 0.440                    | 0.008            |
| JUL 19,84       | JUN 19,84        | 0.05             | 0.53                     | 0.020            | 0.025            | <W 0.005       | 0.160                    | 0.017            |
| AUG 14,84       | JUL 19,84        | 0.14             | 0.39                     | 0.030            | 0.020            | 0.045          | 0.305                    | 0.006            |
| SEP 11,84       | AUG 14,84        | 0.12             | 0.64                     | 0.015            | 0.015            | 0.025          | 0.275                    | 0.005            |
| OCT 9,84        | SEP 11,84        | 0.10             | 0.29                     | 0.020            | 0.065            | 0.035          | 0.270                    | <T 0.002         |
| NOV 6,84        | OCT 9,84         | 0.09             | 0.25                     | 0.020            | <T 0.005         | 0.020          | 0.220                    | <T 0.003         |
| DEC 10,84       | NOV 6,84         | 0.10             | 0.24                     | 0.005            | <W 0.005         | 0.015          | 0.155                    | <T 0.004         |
| JAN 2,85        | DEC 10,84        | 0.08             | 0.07                     | <T 0.010         | <T 0.005         | 0.030          | 0.030                    | 0.005            |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | MANGANSE<br>MG/L | NICKEL<br>MG/L | ZINC<br>MG/L | IRON<br>MG/L | LEAD<br>MG/L | VANADIUM<br>MG/L | ALUMINUM<br>MG/L |
|-----------------|------------------|------------------|----------------|--------------|--------------|--------------|------------------|------------------|
| FEB 2,84        | JAN 4,84         | *****            | *****          | *****        | *****        | *****        | *****            | *****            |
| FEB 28,84       | FEB 2,84         | 0.002            | 0.005          | 0.005        | 0.027        | 0.008        | < 0.002          | 0.036            |
| MAR 27,84       | FEB 28,84        | 0.013            | < 0.001        | 0.007        | U 0.330      | 0.011        | < 0.002          | U 0.356          |
| APR 24,84       | MAR 27,84        | 0.001            | < 0.001        | < 0.003      | 0.035        | 0.003        | < 0.002          | 0.036            |
| MAY 23,84       | APR 24,84        | G 0.015          | < 0.001        | 0.007        | 0.152        | 0.008        | < 0.002          | G 0.142          |
| JUN 19,84       | MAY 23,84        | 0.004            | < 0.001        | 0.003        | 0.012        | 0.005        | < 0.002          | 0.019            |
| JUL 19,84       | JUN 19,84        | 0.002            | < 0.001        | 0.003        | 0.028        | 0.009        | < 0.002          | 0.023            |
| AUG 14,84       | JUL 19,84        | 0.002            | < 0.001        | 0.005        | 0.026        | 0.003        | < 0.002          | 0.020            |
| SEP 11,84       | AUG 14,84        | 0.002            | < 0.001        | 0.008        | 0.018        | 0.007        | < 0.002          | 0.021            |
| OCT 9,84        | SEP 11,84        | 0.002            | < 0.001        | 0.004        | 0.020        | 0.004        | < 0.002          | 0.023            |
| NOV 6,84        | OCT 9,84         | 0.001            | < 0.001        | 0.003        | 0.018        | 0.003        | < 0.002          | 0.020            |
| DEC 10,84       | NOV 6,84         | 0.002            | 0.001          | 0.008        | 0.057        | 0.010        | < 0.000          | 0.031            |
| JAN 2,85        | DEC 10,84        | 0.001            | 0.000          | 0.002        | 0.019        | 0.002        | < 0.000          | 0.014            |

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ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

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STATION NAME : MATTAWA/CUMULATIVE PRECIP. #22 PAGE : 3

| REMOVAL<br>DATE | EXPOSURE<br>DATE | COPPER<br>MG/L | CADMIUM<br>MG/L | FREE H+<br>MG/L |
|-----------------|------------------|----------------|-----------------|-----------------|
| FEB 2,84        | JAN 4,84         | *****          | *****           | 0.1023          |
| FEB 28,84       | FEB 2,84         | < 0.002        | < 0.0001        | 0.0708          |
| MAR 27,84       | FEB 28,84        | 0.002          | 0.0001          | 0.0437          |
| APR 24,84       | MAR 27,84        | 0.001          | < 0.0001        | 0.0240          |
| MAY 23,84       | APR 24,84        | < 0.002        | < 0.0001        | 0.0288          |
| JUN 19,84       | MAY 23,84        | < 0.001        | 0.0001          | 0.0417          |
| JUL 19,84       | JUN 19,84        | < 0.001        | < 0.0001        | 0.0457          |
| AUG 14,84       | JUL 19,84        | 0.001          | 0.0001          | 0.0794          |
| SEP 11,84       | AUG 14,84        | < 0.001        | < 0.0001        | 0.0759          |
| OCT 9,84        | SEP 11,84        | 0.002          | 0.0001          | 0.0324          |
| NOV 6,84        | OCT 9,84         | < 0.001        | 0.0001          | 0.0468          |
| DEC 10,84       | NOV 6,84         | 0.001          | 0.0001          | 0.0347          |
| JAN 2,85        | DEC 10,84        | < 0.000        | < 0.0000        | 0.0234          |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : MCKELLAR/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | SAMPLING<br>START<br>HR. | END<br>HR. | SAMPLE<br>TYPE<br>01-RAIN<br>02-SNOW<br>03-COMP/04-OTHER | GAUGE<br>DEPTH(MM) | GAUGE<br>TYPE<br>00-APIOS<br>09-AES | SAMPLE<br>NUMBER | PROJECT<br>CODE<br>02-APIOS<br>03-SPECIAL | SUBPROJECT<br>CODE<br>01-MOE<br>03-AES | SAMPLER<br>EFFICI-<br>ENCY<br>(%) | COMMENTS<br>FIELD OFFICE |
|-----------------|------------------|--------------------------|------------|--|--------------------|-------------------------------------|------------------|---|--|-----------------------------------|--------------------------|
| JAN 31,84       | JAN 3,84         | 1330                     | 800        | 2  | 22.1               | 0                                   | 11776            | 2   | 1                                      | U 80                              | G                        |
| FEB 29,84       | JAN 31,84        | 800                      | 800        | 2  | 94.3               | 0                                   | 11794            | 2   | 1                                      | 58                                |                          |
| MAR 27,84       | FEB 29,84        | 900                      | 900        | 3  | 37.9               | 0                                   | 11813            | 2   | 1                                      | U 38                              | GD HCM                   |
| APR 24,84       | MAR 27,84        | 900                      | 800        | 1  | 72.7               | 9                                   | 11818            | 2   | 1                                      | 79                                | AD N                     |
| MAY 22,84       | APR 24,84        | 800                      | 800        | 1  | 50.1               | 9                                   | 11832            | 2   | 1                                      | 56                                | AC                       |
| JUN 20,84       | MAY 22,84        | 800                      | 1305       | 1  | 123.8              | 9                                   | 11844            | 2   | 1                                      | 85                                | AC                       |
| JUL 17,84       | JUN 20,84        | 1305                     | 810        | 1  | 165.0              | 0                                   | 11861            | 2   | 1                                      | 76                                | CAD                      |
| AUG 14,84       | JUL 17,84        | 810                      | 1030       | 1  | 100.0              | 0                                   | 11873            | 2   | 1                                      | U 75                              | CDFG                     |
| SEP 11,84       | AUG 14,84        | 1030                     | 800        | 1  | 80.0               | 0                                   | 35214            | 2   | 1                                      | U 87                              | G                        |
| OCT 9,84        | SEP 11,84        | 800                      | 800        | 1  | 55.0               | 0                                   | 35237            | 2   | 1                                      | 82                                | CD                       |
| NOV 6,84        | OCT 9,84         | 810                      | 800        | 3  | 132.0              | 0                                   | 35262            | 2   | 1                                      | 59                                |                          |
| DEC 4,84        | NOV 6,84         | 810                      | 830        | 3  | 62.9               | 9                                   | 35271            | 2   | 1                                      | 59                                |                          |
| JAN 2,85        | DEC 4,84         | 840                      | 830        | 2  | 133.0              | 0                                   | 35302            | 2   | 1                                      | U 69                              | CG                       |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | VOLUME<br>ML | CONDUCT.<br>UMHO/CM | PH<br>LAB | TOTAL H+<br>TO PH8.3<br>MG/L | SULPHATE<br>MG/L | NITRATE<br>AS N<br>MG/L | CALCIUM<br>MG/L |
|-----------------|------------------|--------------|---------------------|-----------|------------------------------|------------------|-------------------------|-----------------|
| JAN 31,84       | JAN 3,84         | 575.0        | 47.2                | 4.00      | 0.1252                       | 2.35             | G 1.20                  | 0.17            |
| FEB 29,84       | JAN 31,84        | 1801.0       | 38.8                | 4.07      | 0.1042                       | 2.45             | 0.82                    | 0.10            |
| MAR 27,84       | FEB 29,84        | 469.0        | 4.5                 | U 5.68    | 0.0220                       | D 0.15           | 0.04                    | 0.03            |
| APR 24,84       | MAR 27,84        | 1885.0       | 14.7                | 4.56      | 0.0526                       | 1.05             | 0.20                    | 0.06            |
| MAY 22,84       | APR 24,84        | 911.0        | 49.0                | 4.14      | 0.1244                       | 5.75             | 0.86                    | 1.09            |
| JUN 20,84       | MAY 22,84        | 3421.0       | 28.0                | 4.49      | 0.0704                       | 4.05             | 0.51                    | 0.31            |
| JUL 17,84       | JUN 20,84        | 4083.0       | 29.5                | 4.22      | 0.0790                       | 3.30             | 0.35                    | 0.16            |
| AUG 14,84       | JUL 17,84        | 2464.0       | 24.4                | 4.46      | 0.0548                       | 3.10             | 0.32                    | 0.26            |
| SEP 11,84       | AUG 14,84        | 2271.0       | 24.9                | 4.31      | 0.0682                       | 2.45             | 0.28                    | 0.12            |
| OCT 9,84        | SEP 11,84        | 1480.0       | 37.0                | 4.22      | 0.0904                       | 3.75             | 0.62                    | 0.35            |
| NOV 6,84        | OCT 9,84         | 2569.0       | 31.0                | 4.23      | 0.0810                       | 2.80             | 0.40                    | 0.09            |
| DEC 4,84        | NOV 6,84         | 1214.0       | 22.9                | 4.47      | 0.0584                       | 1.80             | 0.50                    | 0.20            |
| JAN 2,85        | DEC 4,84         | 3004.0       | 15.9                | 4.56      | 0.0508                       | 1.10             | 0.26                    | 0.06            |



ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : MCKELLAR/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | CHLORIDE<br>MG/L | KJELDAHL<br>AS N<br>MG/L | MAGNESIM<br>MG/L | POTASSIM<br>MG/L | SODIUM<br>MG/L | AMMONIUM<br>AS N<br>MG/L | PHOSPHOR<br>MG/L |
|-----------------|------------------|------------------|--------------------------|------------------|------------------|----------------|--------------------------|------------------|
| JAN 31,84       | JAN 3,84         | G 0.49           | 0.56                     | 0.035            | 0.035            | 0.265          | 0.480                    | 0.008            |
| FEB 29,84       | JAN 31,84        | 0.24             | 0.41                     | 0.015            | <T 0.010         | 0.170          | 0.372                    | 0.006            |
| MAR 27,84       | FEB 29,84        | 0.19             | 0.14                     | <T 0.005         | <W 0.005         | 0.060          | 0.008                    | 0.018            |
| APR 24,84       | MAR 27,84        | 0.08             | 0.10                     | 0.005            | <T 0.010         | 0.065          | 0.025                    | 0.015            |
| MAY 22,84       | APR 24,84        | B 0.44           | 1.19                     | 0.185            | 0.155            | B 0.275        | 0.425                    | 0.073            |
| JUN 20,84       | MAY 22,84        | 0.16             | 1.39                     | 0.105            | 0.225            | 0.095          | 0.880                    | 0.096            |
| JUL 17,84       | JUN 20,84        | 0.13             | 0.43                     | 0.025            | 0.015            | 0.010          | 0.340                    | 0.008            |
| AUG 14,84       | JUL 17,84        | G 0.37           | 1.53                     | 0.045            | 0.200            | B 0.365        | 0.360                    | 0.016            |
| SEP 11,84       | AUG 14,84        | 0.15             | 0.32                     | 0.015            | D 0.025          | 0.080          | 0.225                    | <T 0.002         |
| OCT 9,84        | SEP 11,84        | 0.14             | 0.64                     | 0.075            | 0.055            | 0.070          | 0.450                    | 0.016            |
| NOV 6,84        | OCT 9,84         | 0.11             | 0.31                     | 0.015            | <T 0.005         | 0.020          | 0.270                    | <T 0.001         |
| DEC 4,84        | NOV 6,84         | 0.12             | 0.47                     | 0.025            | <W 0.005         | 0.030          | 0.330                    | <T 0.002         |
| JAN 2,85        | DEC 4,84         | 0.14             | 0.13                     | <T 0.010         | <T 0.010         | 0.060          | 0.100                    | <T 0.003         |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | MANGANSE<br>MG/L | NICKEL<br>MG/L | ZINC<br>MG/L | IRON<br>MG/L | LEAD<br>MG/L | VANADIUM<br>MG/L | ALUMINUM<br>MG/L |
|-----------------|------------------|------------------|----------------|--------------|--------------|--------------|------------------|------------------|
| JAN 31,84       | JAN 3,84         | 0.003            | 0.002          | 0.022        | 0.083        | 0.018        | < 0.002          | 0.091            |
| FEB 29,84       | JAN 31,84        | 0.002            | < 0.001        | 0.007        | 0.016        | 0.007        | < 0.002          | 0.021            |
| MAR 27,84       | FEB 29,84        | < 0.001          | < 0.001        | < 0.006      | 0.083        | 0.006        | < 0.002          | 0.093            |
| APR 24,84       | MAR 27,84        | < 0.001          | < 0.001        | < 0.003      | 0.009        | 0.004        | < 0.002          | 0.014            |
| MAY 22,84       | APR 24,84        | G 0.015          | < 0.001        | 0.011        | G 0.291      | 0.016        | < 0.002          | G 0.352          |
| JUN 20,84       | MAY 22,84        | 0.006            | < 0.001        | 0.007        | 0.042        | 0.006        | < 0.002          | 0.043            |
| JUL 17,84       | JUN 20,84        | 0.002            | < 0.001        | 0.003        | D 0.038      | 0.008        | < 0.002          | 0.036            |
| AUG 14,84       | JUL 17,84        | 0.003            | 0.003          | 0.023        | 0.097        | 0.009        | < 0.002          | 0.050            |
| SEP 11,84       | AUG 14,84        | 0.002            | < 0.001        | 0.007        | 0.011        | 0.007        | < 0.002          | 0.015            |
| OCT 9,84        | SEP 11,84        | 0.003            | < 0.001        | 0.007        | 0.049        | 0.007        | < 0.002          | 0.033            |
| NOV 6,84        | OCT 9,84         | 0.001            | < 0.001        | 0.004        | 0.013        | 0.007        | < 0.002          | 0.016            |
| DEC 4,84        | NOV 6,84         | 0.002            | 0.000          | 0.008        | D 0.049      | 0.010        | < 0.000          | 0.017            |
| JAN 2,85        | DEC 4,84         | 0.001            | 0.000          | 0.002        | 0.027        | 0.003        | < 0.000          | 0.017            |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

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STATION NAME : MCKELLAR/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | COPPER<br>MG/L | CADMIUM<br>MG/L | FREE H+<br>MG/L |
|-----------------|------------------|----------------|-----------------|-----------------|
| JAN 31,84       | JAN 3,84         | 0.004          | 0.0007          | 0.1000          |
| FEB 29,84       | JAN 31,84        | 0.002          | 0.0002          | 0.0851          |
| MAR 27,84       | FEB 29,84        | < 0.003        | < 0.0001        | U 0.0021        |
| APR 24,84       | MAR 27,84        | < 0.002        | < 0.0001        | 0.0275          |
| MAY 22,84       | APR 24,84        | 0.002          | < 0.0001        | 0.0724          |
| JUN 20,84       | MAY 22,84        | 0.001          | 0.0001          | 0.0324          |
| JUL 17,84       | JUN 20,84        | < 0.001        | < 0.0001        | 0.0603          |
| AUG 14,84       | JUL 17,84        | 0.004          | 0.0011          | 0.0347          |
| SEP 11,84       | AUG 14,84        | < 0.001        | 0.0001          | 0.0490          |
| OCT 9,84        | SEP 11,84        | 0.001          | 0.0001          | 0.0603          |
| NOV 6,84        | OCT 9,84         | < 0.001        | 0.0001          | 0.0589          |
| DEC 4,84        | NOV 6,84         | 0.001          | 0.0001          | 0.0339          |
| JAN 2,85        | DEC 4,84         | 0.000          | 0.0001          | 0.0275          |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : MOONBEAM/CUMULATIVE PRECIP.

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PAGE : 1

| REMOVAL<br>DATE | EXPOSURE<br>DATE | SAMPLING<br>START<br>HR. | END<br>HR. | SAMPLE<br>TYPE<br>01-RAIN<br>02-SNOW<br>03-COMP/04-OTHER | GAUGE<br>DEPTH(MM) | GAUGE<br>TYPE<br>00-APIOS<br>09-AES | SAMPLE<br>NUMBER | PROJECT<br>CODE<br>02-APIOS<br>03-SPECIAL | SUBPROJECT<br>CODE<br>01-MOE<br>03-AES | SAMPLER<br>EFFICI-<br>ENCY<br>(%) | COMMENTS<br>FIELD OFFICE |
|-----------------|------------------|--------------------------|------------|--|--------------------|-------------------------------------|------------------|---|--|-----------------------------------|--------------------------|
| FEB 7,84        | JAN 4,84         | 1526                     | 1545       | 3  | 6.2                | 0                                   | 11782            | 2   | 1                                      | 74                                |                          |
| FEB 28,84       | FEB 7,84         | 1545                     | 1450       | 3  | 20.6               | 0                                   | 11800            | 2   | 1                                      | U 7                               | G N                      |
| MAR 27,84       | FEB 28,84        | 1605                     | 1625       | 3  | 31.0               | 0                                   | 11812            | 2   | 1                                      | 53                                |                          |
| APR 24,84       | MAR 27,84        | 1625                     | 1310       | 1  | 1.0                | 0                                   | 11822            | 2   | 1                                      | 3                                 | AC N                     |
| MAY 24,84       | APR 24,84        | 1310                     | 1458       | 1  | 40.6               | 0                                   | 11840            | 2   | 1                                      | 78                                | H                        |
| JUN 19,84       | MAY 24,84        | 1458                     | 1430       | 1  | 84.8               | 0                                   | 11852            | 2   | 1                                      | 88                                | C                        |
| JUL 17,84       | JUN 19,84        | 1430                     | 2030       | 1  | 150.0              | 0                                   | 11864            | 2   | 1                                      | 78                                | CD                       |
| AUG 14,84       | JUL 17,84        | 2030                     | 2000       | 1  | 103.8              | 9                                   | 11871            | 2   | 1                                      | 54                                | C N                      |
| SEP 11,84       | AUG 14,84        | 2000                     | 1355       | 1  | 60.0               | 0                                   | 35216            | 2   | 1                                      | U 57                              | G                        |
| OCT 10,84       | SEP 11,84        | 1416                     | 1440       | 1  | 70.0               | 0                                   | 35234            | 2   | 1                                      | 75                                | C                        |
| NOV 6,84        | OCT 10,84        | 1440                     | 1320       | 3  | 76.6               | 9                                   | 35251            | 2   | 1                                      | 76                                | ACDG                     |
| DEC 4,84        | NOV 6,84         | 1320                     | 1340       | 3  | 52.6               | 9                                   | 35274            | 2   | 1                                      | 31                                |                          |
| JAN 3,85        | NOV 6,84         | 1230                     | 1415       | 3  | 59.0               | 0                                   | 35310            | 2   | 1                                      | 40                                | N                        |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | VOLUME<br>ML | CONDUCT.<br>UMHO/CM | PH<br>LAB | TOTAL H+<br>TO PH8.3<br>MG/L | SULPHATE<br>MG/L | NITRATE<br>AS N<br>MG/L | CALCIUM<br>MG/L |
|-----------------|------------------|--------------|---------------------|-----------|------------------------------|------------------|-------------------------|-----------------|
| FEB 7,84        | JAN 4,84         | 150.0        | 31.3                | 4.35      | 0.0808                       | 3.50             | 0.53                    | *****           |
| FEB 28,84       | FEB 7,84         | 47.0         | 11.8                | U 6.93    | 0.0160                       | 2.25             | 0.20                    | *****           |
| MAR 27,84       | FEB 28,84        | 542.0        | 25.8                | 4.44      | 0.0654                       | 2.90             | 0.41                    | G 0.53          |
| APR 24,84       | MAR 27,84        | 1.0          | *****               | *****     | *****                        | *****            | *****                   | *****           |
| MAY 24,84       | APR 24,84        | 1033.0       | 18.9                | 4.73      | 0.0524                       | 3.15             | 0.37                    | G 0.77          |
| JUN 19,84       | MAY 24,84        | 2438.0       | 16.0                | 4.66      | 0.0468                       | 1.90             | 0.17                    | 0.14            |
| JUL 17,84       | JUN 19,84        | 3808.0       | 21.5                | 4.34      | 0.0656                       | 2.70             | 0.24                    | 0.14            |
| AUG 14,84       | JUL 17,84        | 1831.0       | 11.0                | 4.78      | 0.0360                       | 1.15             | 0.11                    | 0.08            |
| SEP 11,84       | AUG 14,84        | 1128.0       | 13.2                | 4.79      | 0.0394                       | 1.70             | 0.16                    | *****           |
| OCT 10,84       | SEP 11,84        | 1707.0       | 11.5                | 4.74      | 0.0402                       | 1.25             | 0.09                    | 0.08            |
| NOV 6,84        | OCT 10,84        | 1908.0       | 10.4                | 4.79      | 0.0360                       | 0.80             | 0.13                    | 0.07            |
| DEC 4,84        | NOV 6,84         | 539.0        | 21.8                | U 4.74    | 0.0440                       | 2.45             | 0.71                    | U 0.94          |
| JAN 3,85        | NOV 6,84         | 785.0        | 13.7                | 4.67      | *****                        | 1.05             | 0.20                    | 0.10            |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : MOONBEAM/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | CHLORIDE<br>MG/L | KJELDAHL<br>AS N<br>MG/L | MAGNESIM<br>MG/L | POTASSIM<br>MG/L | SODIUM<br>MG/L | AMMONIUM<br>AS N<br>MG/L | PHOSPHOR<br>MG/L |
|-----------------|------------------|------------------|--------------------------|------------------|------------------|----------------|--------------------------|------------------|
| FEB 7,84        | JAN 4,84         | G 0.48           | 0.62                     | *****            | *****            | *****          | 0.400                    | 0.010            |
| FEB 28,84       | FEB 7,84         | 0.16             | *****                    | *****            | *****            | *****          | 0.216                    | *****            |
| MAR 27,84       | FEB 28,84        | 0.21             | 0.23                     | G 0.115          | 0.030            | 0.105          | 0.126                    | 0.008            |
| APR 24,84       | MAR 27,84        | *****            | *****                    | *****            | *****            | *****          | *****                    | *****            |
| MAY 24,84       | APR 24,84        | 0.15             | 0.76                     | 0.125            | 0.215            | 0.055          | 0.425                    | 0.015            |
| JUN 19,84       | MAY 24,84        | 0.04             | 0.54                     | 0.030            | 0.160            | 0.020          | 0.280                    | 0.039            |
| JUL 17,84       | JUN 19,84        | 0.09             | 0.40                     | 0.020            | 0.030            | 0.045          | 0.250                    | 0.012            |
| AUG 14,84       | JUL 17,84        | 0.06             | 0.18                     | 0.005            | <W 0.005         | 0.020          | 0.125                    | <T 0.002         |
| SEP 11,84       | AUG 14,84        | 0.11             | *****                    | *****            | *****            | *****          | *****                    | *****            |
| OCT 10,84       | SEP 11,84        | <T 0.02          | 0.11                     | 0.005            | <T 0.015         | <T 0.010       | 0.090                    | <T 0.002         |
| NOV 6,84        | OCT 10,84        | 0.09             | 0.15                     | 0.010            | 0.065            | 0.035          | 0.050                    | 0.019            |
| DEC 4,84        | NOV 6,84         | 0.23             | 0.38                     | U 0.190          | <T 0.010         | 0.085          | 0.295                    | 0.006            |
| JAN 3,85        | NOV 6,84         | 0.33             | 0.16                     | 0.020            | <T 0.010         | G 0.230        | 0.055                    | G 0.045          |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | MANGANSE<br>MG/L | NICKEL<br>MG/L | ZINC<br>MG/L | IRON<br>MG/L | LEAD<br>MG/L | VANADIUM<br>MG/L | ALUMINUM<br>MG/L |
|-----------------|------------------|------------------|----------------|--------------|--------------|--------------|------------------|------------------|
| FEB 7,84        | JAN 4,84         | *****            | *****          | *****        | *****        | *****        | *****            | *****            |
| FEB 28,84       | FEB 7,84         | *****            | *****          | *****        | *****        | *****        | *****            | *****            |
| MAR 27,84       | FEB 28,84        | 0.003            | < 0.001        | 0.005        | 0.032        | 0.006        | < 0.002          | 0.060            |
| APR 24,84       | MAR 27,84        | *****            | *****          | *****        | *****        | *****        | *****            | *****            |
| MAY 24,84       | APR 24,84        | G 0.014          | < 0.001        | 0.006        | G 0.261      | 0.009        | < 0.002          | G 0.402          |
| JUN 19,84       | MAY 24,84        | 0.004            | < 0.001        | 0.002        | 0.038        | 0.004        | < 0.002          | 0.051            |
| JUL 17,84       | JUN 19,84        | 0.003            | < 0.001        | 0.002        | 0.027        | 0.006        | < 0.002          | 0.036            |
| AUG 14,84       | JUL 17,84        | 0.001            | < 0.001        | 0.002        | 0.013        | 0.004        | < 0.002          | 0.007            |
| SEP 11,84       | AUG 14,84        | *****            | *****          | *****        | *****        | *****        | *****            | *****            |
| OCT 10,84       | SEP 11,84        | < 0.001          | < 0.001        | < 0.003      | 0.024        | 0.004        | < 0.002          | 0.014            |
| NOV 6,84        | OCT 10,84        | < 0.001          | < 0.001        | < 0.003      | D 0.005      | 0.004        | < 0.002          | 0.008            |
| DEC 4,84        | NOV 6,84         | 0.006            | 0.000          | 0.009        | G 0.137      | 0.007        | < 0.000          | 0.070            |
| JAN 3,85        | NOV 6,84         | 0.001            | 0.000          | 0.003        | 0.018        | 0.003        | < 0.000          | 0.045            |

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ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

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STATION NAME : MOONBEAM/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | COPPER<br>MG/L | CADMIUM<br>MG/L | FREE H+<br>MG/L |
|-----------------|------------------|----------------|-----------------|-----------------|
| FEB 7,84        | JAN 4,84         | *****          | *****           | 0.0447          |
| FEB 28,84       | FEB 7,84         | *****          | *****           | U 0.0001        |
| MAR 27,84       | FEB 28,84        | < 0.003        | 0.0001          | 0.0363          |
| APR 24,84       | MAR 27,84        | *****          | *****           | *****           |
| MAY 24,84       | APR 24,84        | < 0.002        | < 0.0001        | 0.0186          |
| JUN 19,84       | MAY 24,84        | < 0.001        | 0.0001          | 0.0219          |
| JUL 17,84       | JUN 19,84        | 0.001          | 0.0001          | 0.0457          |
| AUG 14,84       | JUL 17,84        | 0.001          | < 0.0001        | 0.0166          |
| SEP 11,84       | AUG 14,84        | *****          | *****           | 0.0162          |
| OCT 10,84       | SEP 11,84        | 0.001          | 0.0001          | 0.0182          |
| NOV 6,84        | OCT 10,84        | < 0.002        | 0.0001          | 0.0162          |
| DEC 4,84        | NOV 6,84         | 0.001          | 0.0001          | U 0.0182        |
| JAN 3,85        | NOV 6,84         | 0.001          | < 0.0000        | 0.0214          |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : TURKEY LAKE/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | SAMPLING<br>START<br>HR. | SAMPLING<br>END<br>HR. | SAMPLE<br>TYPE<br>01-RAIN<br>02-SNOW<br>03-COMP/04-OTHER | GAUGE<br>DEPTH(MM) | GAUGE<br>TYPE<br>00-APIOS<br>09-AES | SAMPLE<br>NUMBER | PROJECT<br>CODE<br>02-APIOS<br>03-SPECIAL | SUBPROJECT<br>CODE<br>01-MOE<br>03-AES | SAMPLER<br>EFFICI-<br>ENCY<br>(%) | COMMENTS<br>FIELD OFFICE |
|-----------------|------------------|--------------------------|------------------------|--|--------------------|-------------------------------------|------------------|---|--|-----------------------------------|--------------------------|
| JAN 31,84       | JAN 4,84         | 1100                     | 1250                   | 2  | 57.7               | 9                                   | 11774            | 2   | 1                                      | 53                                |                          |
| FEB 28,84       | JAN 31,84        | 1250                     | 1100                   | 3  | 38.3               | 9                                   | 11792            | 2   | 1                                      | 74                                | F                        |
| MAR 27,84       | FEB 28,84        | 1130                     | 1130                   | 3  | 61.9               | 9                                   | 11815            | 2   | 1                                      | 70                                | FJCD                     |
| APR 24,84       | MAR 27,84        | 1145                     | 1115                   | 1  | 4.6                | 9                                   | 11817            | 2   | 1                                      | 84                                |                          |
| MAY 22,84       | APR 24,84        | 1115                     | 830                    | 1  | 100.6              | 9                                   | 11830            | 2   | 1                                      | 60                                | FJ                       |
| JUN 19,84       | MAY 22,84        | 900                      | 1110                   | 1  | 50.7               | 9                                   | 11853            | 2   | 1                                      | 93                                | ACJ                      |
| JUL 17,84       | JUN 19,84        | 1110                     | 1010                   | 1  | 99.3               | 9                                   | 11865            | 2   | 1                                      | 89                                | QD                       |
| AUG 14,84       | JUL 17,84        | 1030                     | 1045                   | 1  | 64.7               | 9                                   | 11870            | 2   | 1                                      | 73                                | C                        |
| SEP 11,84       | AUG 14,84        | 1045                     | 1515                   | 1  | 164.1              | 9                                   | 35218            | 2   | 1                                      | 54                                |                          |
| OCT 9,84        | SEP 11,84        | 1540                     | 1305                   | 1  | 110.9              | 9                                   | 35235            | 2   | 1                                      | 98                                | BCD                      |
| OCT 20,84       | OCT 9,84         | 1305                     | 1305                   | 3  | 56.1               | 9                                   | 35260            | 2   | 1                                      | 40                                | H                        |
| NOV 6,84        | OCT 20,84        | 1305                     | 1130                   | 3  | 230.0              | 9                                   | 35259            | 2   | 1                                      | 50                                | CD                       |
| DEC 4,84        | NOV 6,84         | 1230                     | 1130                   | 3  | 111.2              | 9                                   | 35280            | 2   | 1                                      | 60                                |                          |
| JAN 1,85        | DEC 4,84         | 1130                     | 1200                   | 2  | 161.5              | 9                                   | 35305            | 2   | 1                                      | 7                                 | G                        |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | VOLUME<br>ML | CONDUCT.<br>UMHO/CM | PH<br>LAB | TOTAL H+<br>TO PH8.3<br>MG/L | SULPHATE<br>MG/L | NITRATE<br>AS N<br>MG/L | CALCIUM<br>MG/L |
|-----------------|------------------|--------------|---------------------|-----------|------------------------------|------------------|-------------------------|-----------------|
| JAN 31,84       | JAN 4,84         | 1010.0       | 14.0                | D 4.68    | 0.0426                       | 0.90             | 0.38                    | 0.16            |
| FEB 28,84       | JAN 31,84        | 930.0        | 38.9                | 4.13      | 0.1020                       | 3.30             | 0.80                    | 0.23            |
| MAR 27,84       | FEB 28,84        | 1423.0       | 28.8                | 4.31      | 0.0818                       | 2.70             | 0.42                    | 0.19            |
| APR 24,84       | MAR 27,84        | 126.0        | *****               | 4.12      | 0.1174                       | *****            | *****                   | B 0.42          |
| MAY 22,84       | APR 24,84        | 1969.0       | 26.0                | 4.49      | 0.0640                       | 3.70             | 0.48                    | 0.66            |
| JUN 19,84       | MAY 22,84        | 1536.0       | 27.0                | 4.38      | 0.0674                       | D 4.30           | 0.54                    | D 0.67          |
| JUL 17,84       | JUN 19,84        | 2901.0       | 14.6                | 4.69      | 0.0390                       | 1.80             | 0.27                    | 0.19            |
| AUG 14,84       | JUL 17,84        | 1544.0       | 26.3                | 4.35      | 0.0652                       | 3.15             | 0.23                    | 0.14            |
| SEP 11,84       | AUG 14,84        | 2926.0       | 32.6                | 4.23      | 0.0820                       | D 3.85           | 0.28                    | 0.16            |
| OCT 9,84        | SEP 11,84        | 3543.0       | 18.2                | 4.73      | 0.0512                       | D 2.65           | 0.30                    | 0.43            |
| OCT 20,84       | OCT 9,84         | 734.0        | 20.5                | 4.75      | 0.0594                       | 3.50             | 0.34                    | U 1.10          |
| NOV 6,84        | OCT 20,84        | 3775.0       | 22.1                | 4.42      | 0.0588                       | 2.10             | 0.35                    | 0.13            |
| DEC 4,84        | NOV 6,84         | 2197.0       | 26.8                | 4.38      | 0.0670                       | 2.20             | 0.59                    | 0.24            |
| JAN 1,85        | DEC 4,84         | 416.0        | 13.0                | 4.74      | *****                        | 0.95             | 0.32                    | 0.06            |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : TURKEY LAKE/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | CHLORIDE<br>MG/L | KJELDAHL<br>AS N<br>MG/L | MAGNESIM<br>MG/L | POTASSIM<br>MG/L | SODIUM<br>MG/L | AMMONIUM<br>AS N<br>MG/L | PHOSPHOR<br>MG/L |
|-----------------|------------------|------------------|--------------------------|------------------|------------------|----------------|--------------------------|------------------|
| JAN 31,84       | JAN 4,84         | 0.07             | 0.32                     | 0.025            | <W 0.005         | 0.040          | 0.208                    | 0.011            |
| FEB 28,84       | JAN 31,84        | 0.17             | 0.65                     | 0.030            | 0.035            | 0.095          | 0.560                    | 0.010            |
| MAR 27,84       | FEB 28,84        | 0.15             | 0.30                     | 0.035            | 0.020            | 0.045          | 0.202                    | 0.011            |
| APR 24,84       | MAR 27,84        | *****            | *****                    | B 0.125          | G 0.395          | G 0.180        | 0.130                    | *****            |
| MAY 22,84       | APR 24,84        | 0.16             | 0.67                     | 0.110            | 0.120            | 0.080          | 0.505                    | 0.014            |
| JUN 19,84       | MAY 22,84        | 0.14             | D 1.19                   | D 0.125          | 0.215            | 0.090          | D 0.675                  | 0.050            |
| JUL 17,84       | JUN 19,84        | 0.04             | 0.41                     | 0.030            | 0.015            | <W 0.005       | 0.345                    | <T 0.003         |
| AUG 14,84       | JUL 17,84        | 0.06             | 0.54                     | 0.030            | <W 0.005         | 0.015          | 0.440                    | 0.006            |
| SEP 11,84       | AUG 14,84        | 0.11             | 0.49                     | 0.015            | 0.020            | 0.020          | 0.440                    | <T 0.004         |
| OCT 9,84        | SEP 11,84        | 0.04             | 0.37                     | D 0.135          | 0.185            | 0.025          | 0.290                    | 0.005            |
| OCT 20,84       | OCT 9,84         | 0.09             | 0.29                     | U 0.220          | U 0.730          | 0.030          | 0.035                    | 0.014            |
| NOV 6,84        | OCT 20,84        | 0.09             | 0.32                     | 0.020            | 0.030            | 0.040          | 0.300                    | <T 0.002         |
| DEC 4,84        | NOV 6,84         | 0.15             | 0.47                     | 0.025            | 0.015            | 0.055          | 0.420                    | <T 0.004         |
| JAN 1,85        | DEC 4,84         | 0.14             | 0.41                     | <T 0.005         | <T 0.020         | <T 0.010       | 0.310                    | 0.007            |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | MANGANSE<br>MG/L | NICKEL<br>MG/L | ZINC<br>MG/L | IRON<br>MG/L | LEAD<br>MG/L | VANADIUM<br>MG/L | ALUMINUM<br>MG/L |
|-----------------|------------------|------------------|----------------|--------------|--------------|--------------|------------------|------------------|
| JAN 31,84       | JAN 4,84         | 0.001            | < 0.001        | 0.004        | 0.021        | 0.006        | < 0.002          | 0.018            |
| FEB 28,84       | JAN 31,84        | 0.004            | < 0.001        | 0.013        | 0.043        | 0.015        | < 0.002          | 0.058            |
| MAR 27,84       | FEB 28,84        | 0.002            | < 0.001        | 0.005        | 0.028        | 0.010        | < 0.002          | 0.036            |
| APR 24,84       | MAR 27,84        | *****            | *****          | *****        | *****        | *****        | *****            | *****            |
| MAY 22,84       | APR 24,84        | G 0.014          | < 0.001        | 0.006        | 0.112        | 0.007        | < 0.002          | G 0.163          |
| JUN 19,84       | MAY 22,84        | G 0.017          | < 0.001        | 0.007        | B 0.158      | 0.007        | < 0.002          | B 0.194          |
| JUL 17,84       | JUN 19,84        | 0.003            | < 0.001        | < 0.003      | 0.042        | 0.006        | < 0.002          | 0.049            |
| AUG 14,84       | JUL 17,84        | 0.003            | < 0.001        | 0.004        | 0.023        | 0.012        | < 0.002          | 0.022            |
| SEP 11,84       | AUG 14,84        | 0.004            | < 0.001        | 0.004        | 0.019        | 0.006        | < 0.002          | 0.027            |
| OCT 9,84        | SEP 11,84        | 0.003            | < 0.001        | 0.014        | 0.023        | 0.002        | < 0.002          | 0.020            |
| OCT 20,84       | OCT 9,84         | U 0.087          | < 0.001        | 0.008        | 0.025        | 0.006        | < 0.002          | 0.017            |
| NOV 6,84        | OCT 20,84        | 0.003            | < 0.001        | 0.002        | 0.008        | 0.005        | < 0.002          | 0.010            |
| DEC 4,84        | NOV 6,84         | 0.004            | 0.001          | 0.005        | 0.042        | 0.007        | < 0.000          | 0.034            |
| JAN 1,85        | DEC 4,84         | 0.002            | 0.001          | 0.006        | 0.065        | 0.015        | < 0.000          | 0.059            |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

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STATION NAME : TURKEY LAKE/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | COPPER<br>MG/L | CADMIUM<br>MG/L | FREE H+<br>MG/L |
|-----------------|------------------|----------------|-----------------|-----------------|
| JAN 31,84       | JAN 4,84         | < 0.002        | 0.0001          | D 0.0209        |
| FEB 28,84       | JAN 31,84        | 0.003          | 0.0003          | 0.0741          |
| MAR 27,84       | FEB 28,84        | < 0.002        | < 0.0001        | 0.0490          |
| APR 24,84       | MAR 27,84        | *****          | *****           | 0.0759          |
| MAY 22,84       | APR 24,84        | 0.001          | < 0.0001        | 0.0324          |
| JUN 19,84       | MAY 22,84        | 0.003          | 0.0001          | 0.0417          |
| JUL 17,84       | JUN 19,84        | < 0.001        | < 0.0001        | 0.0204          |
| AUG 14,84       | JUL 17,84        | < 0.002        | < 0.0001        | 0.0447          |
| SEP 11,84       | AUG 14,84        | < 0.001        | 0.0001          | 0.0589          |
| OCT 9,84        | SEP 11,84        | 0.001          | 0.0001          | 0.0186          |
| OCT 20,84       | OCT 9,84         | < 0.002        | 0.0001          | 0.0178          |
| NOV 6,84        | OCT 20,84        | < 0.001        | 0.0002          | 0.0380          |
| DEC 4,84        | NOV 6,84         | 0.001          | 0.0001          | 0.0417          |
| JAN 1,85        | DEC 4,84         | 0.001          | 0.0000          | 0.0182          |



ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : WHITNEY/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | SAMPLING<br>START<br>HR. | END<br>HR. | SAMPLE<br>TYPE<br>01-RAIN<br>02-SNOW<br>03-COMP/04-OTHER | GAUGE<br>DEPTH(MM) | GAUGE<br>TYPE<br>00-APIOS<br>09-AES | SAMPLE<br>NUMBER | PROJECT<br>CODE<br>02-APIOS<br>03-SPECIAL | SUBPROJECT<br>CODE<br>01-MOE<br>03-AES | SAMPLER<br>EFFICI-<br>ENCY<br>(%) | COMMENTS<br>FIELD OFFICE |
|-----------------|------------------|--------------------------|------------|--|--------------------|-------------------------------------|------------------|---|--|-----------------------------------|--------------------------|
| JAN 31,84       | JAN 3,84         | 920                      | 920        | 2  | 37.1               | 9                                   | 29287            | 2   | 1                                      | ***                               | EFIK                     |
| MAR 5,84        | JAN 31,84        | 920                      | 1100       | 3  | 66.0               | 0                                   | 29297            | 2   | 1                                      | U 81                              | F                        |
| MAR 29,84       | MAR 5,84         | 1100                     | 1047       | 3  | 42.0               | 0                                   | 29303            | 2   | 1                                      | 84                                | C                        |
| APR 24,84       | MAR 29,84        | 1047                     | 858        | 3  | 77.0               | 0                                   | 29315            | 2   | 1                                      | 72                                | AC                       |
| MAY 22,84       | APR 24,84        | 858                      | 1100       | 1  | 42.0               | 0                                   | 29322            | 2   | 1                                      | U 88                              | ABCFI                    |
| JUN 19,84       | MAY 22,84        | 1100                     | 1700       | 1  | 105.0              | 0                                   | 29331            | 2   | 1                                      | 79                                | Q H                      |
| JUL 17,84       | JUN 19,84        | 1700                     | 1645       | 1  | 112.0              | 0                                   | 29338            | 2   | 1                                      | 89                                |                          |
| AUG 14,84       | JUL 17,84        | 1645                     | 1615       | 1  | 67.0               | 0                                   | 29351            | 2   | 1                                      | 89                                |                          |
| SEP 11,84       | AUG 14,84        | 1615                     | 823        | 1  | 88.0               | 0                                   | 29359            | 2   | 1                                      | 84                                |                          |
| OCT 9,84        | SEP 11,84        | 823                      | 1000       | 1  | 63.0               | 0                                   | 29367            | 2   | 1                                      | 84                                | CQ                       |
| NOV 6,84        | OCT 9,84         | 1000                     | 1530       | 3  | 71.0               | 0                                   | 29378            | 2   | 1                                      | 78                                | Q                        |
| DEC 4,84        | NOV 6,84         | 1530                     | 1330       | 3  | 75.0               | 0                                   | 29385            | 2   | 1                                      | 72                                | M                        |
| JAN 2,85        | DEC 4,84         | 1330                     | 930        | 3  | 94.0               | 0                                   | 29398            | 2   | 1                                      | 71                                | Q                        |

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | VOLUME<br>ML | CONDUCT.<br>UMHO/CM | PH<br>LAB | TOTAL H+<br>TO PH8.3<br>MG/L | SULPHATE<br>MG/L | NITRATE<br>AS N<br>MG/L | CALCIUM<br>MG/L |
|-----------------|------------------|--------------|---------------------|-----------|------------------------------|------------------|-------------------------|-----------------|
| JAN 31,84       | JAN 3,84         | *****        | *****               | *****     | *****                        | *****            | *****                   | *****           |
| MAR 5,84        | JAN 31,84        | 1755.0       | 20.7                | 4.40      | 0.0628                       | 1.45             | 0.38                    | 0.06            |
| MAR 29,84       | MAR 5,84         | 1150.0       | 15.6                | 4.29      | 0.0938                       | 2.35             | 0.46                    | 0.13            |
| APR 24,84       | MAR 29,84        | 1812.0       | 12.0                | 4.77      | 0.0426                       | 1.05             | 0.23                    | 0.10            |
| MAY 22,84       | APR 24,84        | 1210.0       | 27.5                | 4.55      | 0.0798                       | 4.40             | 0.54                    | 0.79            |
| JUN 19,84       | MAY 22,84        | 2707.0       | 31.0                | 4.55      | 0.0766                       | 4.10             | 0.50                    | 0.38            |
| JUL 17,84       | JUN 19,84        | 3267.0       | 28.5                | 4.26      | 0.0802                       | 2.95             | 0.28                    | 0.10            |
| AUG 14,84       | JUL 17,84        | 1955.0       | 34.4                | 4.25      | 0.0874                       | 3.40             | 0.40                    | 0.16            |
| SEP 11,84       | AUG 14,84        | 2411.0       | 30.2                | 4.21      | 0.0846                       | 2.85             | 0.38                    | 0.11            |
| OCT 9,84        | SEP 11,84        | 1734.0       | 24.3                | D 4.56    | 0.0578                       | 2.90             | 0.46                    | 0.30            |
| NOV 6,84        | OCT 9,84         | 1816.0       | 27.8                | 4.25      | 0.0764                       | 2.40             | 0.39                    | 0.09            |
| DEC 4,84        | NOV 6,84         | 1766.0       | 19.6                | 4.49      | 0.0566                       | 1.40             | 0.33                    | 0.06            |
| JAN 2,85        | DEC 4,84         | 2173.0       | 14.8                | 4.50      | *****                        | 0.90             | 0.29                    | <T 0.04         |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : WHITNEY/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | CHLORIDE<br>MG/L | KJELDAHL<br>AS N<br>MG/L | MAGNESIM<br>MG/L | POTASSIM<br>MG/L | SODIUM<br>MG/L | AMMONIUM<br>AS N<br>MG/L | PHOSPHOR<br>MG/L |
|-----------------|------------------|------------------|--------------------------|------------------|------------------|----------------|--------------------------|------------------|
| JAN 31,84       | JAN 3,84         | *****            | *****                    | *****            | *****            | *****          | *****                    | *****            |
| MAR 5,84        | JAN 31,84        | 0.10             | 0.17                     | 0.015            | <T 0.005         | 0.050          | 0.132                    | 0.005            |
| MAR 29,84       | MAR 5,84         | 0.15             | 0.21                     | 0.030            | 0.020            | 0.070          | 0.188                    | 0.010            |
| APR 24,84       | MAR 29,84        | 0.04             | 0.34                     | 0.030            | 0.050            | 0.040          | 0.185                    | G 0.046          |
| MAY 22,84       | APR 24,84        | 0.20             | 1.15                     | 0.140            | 0.190            | 0.120          | 0.765                    | 0.074            |
| JUN 19,84       | MAY 22,84        | 0.14             | 0.92                     | 0.080            | 0.185            | 0.055          | 0.655                    | 0.046            |
| JUL 17,84       | JUN 19,84        | 0.05             | 0.27                     | 0.025            | 0.015            | <T 0.010       | 0.245                    | <T 0.002         |
| AUG 14,84       | JUL 17,84        | 0.08             | 0.52                     | 0.040            | 0.020            | 0.020          | 0.365                    | 0.012            |
| SEP 11,84       | AUG 14,84        | 0.12             | 0.27                     | 0.010            | <T 0.005         | 0.010          | 0.220                    | <T 0.002         |
| OCT 9,84        | SEP 11,84        | B 0.79           | 0.96                     | 0.050            | B 0.755          | G 0.350        | 0.535                    | B 0.128          |
| NOV 6,84        | OCT 9,84         | 0.10             | 0.21                     | 0.015            | <W 0.005         | 0.020          | 0.170                    | <T 0.001         |
| DEC 4,84        | NOV 6,84         | 0.11             | 0.16                     | 0.005            | <W 0.005         | <T 0.005       | 0.140                    | <T 0.002         |
| JAN 2,85        | DEC 4,84         | 0.09             | 0.09                     | <T 0.010         | <T 0.005         | <T 0.015       | 0.050                    | 0.005            |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | MANGANSE<br>MG/L | NICKEL<br>MG/L | ZINC<br>MG/L | IRON<br>MG/L | LEAD<br>MG/L | VANADIUM<br>MG/L | ALUMINUM<br>MG/L |
|-----------------|------------------|------------------|----------------|--------------|--------------|--------------|------------------|------------------|
| JAN 31,84       | JAN 3,84         | *****            | *****          | *****        | *****        | *****        | *****            | *****            |
| MAR 5,84        | JAN 31,84        | 0.001            | < 0.001        | 0.005        | 0.023        | 0.004        | < 0.002          | 0.015            |
| MAR 29,84       | MAR 5,84         | 0.002            | < 0.001        | 0.008        | 0.016        | 0.004        | < 0.002          | 0.024            |
| APR 24,84       | MAR 29,84        | 0.002            | < 0.001        | 0.003        | 0.015        | 0.003        | < 0.002          | 0.019            |
| MAY 22,84       | APR 24,84        | G 0.022          | < 0.001        | 0.013        | G 0.255      | 0.007        | < 0.002          | G 0.281          |
| JUN 19,84       | MAY 22,84        | 0.007            | < 0.001        | 0.005        | 0.080        | 0.011        | < 0.002          | 0.094            |
| JUL 17,84       | JUN 19,84        | 0.001            | < 0.001        | < 0.003      | 0.018        | 0.006        | < 0.002          | 0.009            |
| AUG 14,84       | JUL 17,84        | 0.002            | < 0.001        | 0.003        | 0.021        | 0.006        | < 0.002          | 0.016            |
| SEP 11,84       | AUG 14,84        | 0.001            | < 0.001        | 0.004        | 0.013        | 0.005        | < 0.002          | 0.020            |
| OCT 9,84        | SEP 11,84        | 0.004            | < 0.001        | 0.006        | 0.039        | 0.004        | < 0.002          | 0.031            |
| NOV 6,84        | OCT 9,84         | 0.002            | < 0.001        | 0.002        | 0.007        | 0.003        | < 0.002          | 0.012            |
| DEC 4,84        | NOV 6,84         | 0.001            | < 0.000        | 0.003        | 0.012        | 0.006        | < 0.000          | 0.023            |
| JAN 2,85        | DEC 4,84         | < 0.001          | 0.000          | 0.001        | 0.022        | 0.003        | < 0.000          | 0.022            |

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ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

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STATION NAME : WHITNEY/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | COPPER<br>MG/L | CADMIUM<br>MG/L | FREE H+<br>MG/L |
|-----------------|------------------|----------------|-----------------|-----------------|
| JAN 31,84       | JAN 3,84         | *****          | *****           | *****           |
| MAR 5,84        | JAN 31,84        | < 0.002        | < 0.0001        | 0.0398          |
| MAR 29,84       | MAR 5,84         | 0.002          | 0.0001          | 0.0513          |
| APR 24,84       | MAR 29,84        | 0.002          | < 0.0001        | 0.0170          |
| MAY 22,84       | APR 24,84        | 0.002          | 0.0001          | 0.0282          |
| JUN 19,84       | MAY 22,84        | 0.002          | 0.0001          | 0.0282          |
| JUL 17,84       | JUN 19,84        | 0.001          | 0.0001          | 0.0550          |
| AUG 14,84       | JUL 17,84        | < 0.002        | < 0.0001        | 0.0562          |
| SEP 11,84       | AUG 14,84        | < 0.001        | 0.0001          | 0.0617          |
| OCT 9,84        | SEP 11,84        | 0.001          | 0.0001          | D 0.0275        |
| NOV 6,84        | OCT 9,84         | < 0.002        | 0.0001          | 0.0562          |
| DEC 4,84        | NOV 6,84         | 0.001          | 0.0001          | 0.0324          |
| JAN 2,85        | DEC 4,84         | < 0.000        | 0.0000          | 0.0316          |

PART VII

NORTHWESTERN REGION

CUMULATIVE PRECIPITATION CHEMISTRY LISTINGS

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : DORION/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | SAMPLING<br>START<br>HR. | END<br>HR. | SAMPLE<br>TYPE<br>01-RAIN<br>02-SNOW<br>03-COMP/04-OTHER | GAUGE<br>DEPTH(MM) | GAUGE<br>TYPE<br>00-APIOS<br>09-AES | SAMPLE<br>NUMBER | PROJECT<br>CODE<br>02-APIOS<br>03-SPECIAL | SUBPROJECT<br>CODE<br>01-MOE<br>03-AES | SAMPLER<br>EFFICI-<br>ENCY<br>(%) | COMMENTS<br>FIELD OFFICE |
|-----------------|------------------|--------------------------|------------|--|--------------------|-------------------------------------|------------------|---|--|-----------------------------------|--------------------------|
| JAN 31,84       | JAN 3,84         | 1015                     | 915        | 2  | 24.6               | 0                                   | 13067            | 2   | 1                                      | 63                                | C                        |
| FEB 28,84       | JAN 31,84        | 915                      | 915        | 3  | 36.2               | 0                                   | 13069            | 2   | 1                                      | 63                                | C                        |
| MAR 27,84       | FEB 28,84        | 915                      | 900        | 3  | 21.5               | 0                                   | 13072            | 2   | 1                                      | 91                                | CD                       |
| APR 24,84       | MAR 27,84        | 900                      | 900        | 4  | 1.1                | 0                                   | 34031            | 2   | 1                                      | U 0                               | AK                       |
| MAY 22,84       | APR 24,84        | 900                      | 920        | 1  | 74.6               | 0                                   | 13075            | 2   | 1                                      | U 74                              | ACF H                    |
| JUN 19,84       | MAY 22,84        | 920                      | 900        | 1  | 87.7               | 0                                   | 13077            | 2   | 1                                      | 79                                | CADQ H                   |
| JUL 17,84       | JUN 19,84        | 900                      | 1043       | 1  | 98.0               | 0                                   | 13079            | 2   | 1                                      | 79                                | C                        |
| AUG 14,84       | JUL 17,84        | 1043                     | 912        | 1  | 136.0              | 0                                   | 13081            | 2   | 1                                      | 84                                |                          |
| SEP 11,84       | AUG 14,84        | 912                      | 920        | 1  | 68.0               | 0                                   | 13083            | 2   | 1                                      | 91                                | C                        |
| OCT 9,84        | SEP 11,84        | 920                      | 930        | 1  | 44.0               | 0                                   | 13085            | 2   | 1                                      | 84                                | CD C                     |
| NOV 6,84        | OCT 9,84         | 930                      | 900        | 3  | 100.0              | 0                                   | 13087            | 2   | 1                                      | 81                                | C                        |
| DEC 4,84        | NOV 6,84         | 900                      | 920        | 3  | 41.5               | 0                                   | 13089            | 2   | 1                                      | 85                                |                          |
| JAN 2,85        | DEC 4,84         | 920                      | 930        | 3  | 79.6               | 0                                   | 13091            | 2   | 1                                      | 87                                | M                        |

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | VOLUME<br>ML | CONDUCT.<br>UMHO/CM | PH<br>LAB | TOTAL H+<br>TO PH8.3<br>MG/L | SULPHATE<br>MG/L | NITRATE<br>AS N<br>MG/L | CALCIUM<br>MG/L |
|-----------------|------------------|--------------|---------------------|-----------|------------------------------|------------------|-------------------------|-----------------|
| JAN 31,84       | JAN 3,84         | 505.0        | 10.1                | 4.80      | 0.0394                       | 0.60             | 0.19                    | 0.10            |
| FEB 28,84       | JAN 31,84        | 750.0        | 33.5                | 4.13      | 0.0946                       | 2.95             | 0.55                    | 0.10            |
| MAR 27,84       | FEB 28,84        | 641.0        | 18.3                | 4.53      | 0.0526                       | 1.45             | 0.38                    | 0.20            |
| APR 24,84       | MAR 27,84        | 0.0          | *****               | *****     | *****                        | *****            | *****                   | *****           |
| MAY 22,84       | APR 24,84        | 1813.0       | 19.7                | 5.36      | 0.0380                       | G 3.55           | G 0.47                  | G 1.08          |
| JUN 19,84       | MAY 22,84        | 2274.0       | 8.5                 | 5.40      | 0.0226                       | 1.40             | 0.26                    | 0.25            |
| JUL 17,84       | JUN 19,84        | 2533.0       | 5.8                 | 4.97      | 0.0260                       | 0.60             | 0.09                    | 0.07            |
| AUG 14,84       | JUL 17,84        | 3747.0       | 8.0                 | 4.96      | 0.0344                       | 0.75             | 0.09                    | 0.06            |
| SEP 11,84       | AUG 14,84        | 2018.0       | 5.8                 | 5.46      | 0.0226                       | 0.75             | 0.15                    | 0.21            |
| OCT 9,84        | SEP 11,84        | 1214.0       | 6.5                 | 5.34      | 0.0290                       | 0.85             | 0.10                    | 0.14            |
| NOV 6,84        | OCT 9,84         | 2640.0       | G 23.9              | 4.35      | B 0.0672                     | 2.30             | 0.34                    | 0.06            |
| DEC 4,84        | NOV 6,84         | 1158.0       | 31.5                | 4.33      | 0.0764                       | 2.45             | 0.75                    | 0.25            |
| JAN 2,85        | DEC 4,84         | 2252.0       | 8.3                 | 4.88      | *****                        | 0.65             | 0.11                    | <T 0.04         |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : DORION/CUMULATIVE PRECIP.

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PAGE : 2

| REMOVAL<br>DATE | EXPOSURE<br>DATE | CHLORIDE<br>MG/L | KJELDAHL<br>AS N<br>MG/L | MAGNESIM<br>MG/L | POTASSIM<br>MG/L | SODIUM<br>MG/L | AMMONIUM<br>AS N<br>MG/L | PHOSPHOR<br>MG/L |
|-----------------|------------------|------------------|--------------------------|------------------|------------------|----------------|--------------------------|------------------|
| JAN 31,84       | JAN 3,84         | 0.13             | 0.09                     | 0.025            | <T 0.005         | 0.110          | 0.020                    | 0.026            |
| FEB 28,84       | JAN 31,84        | 0.15             | 0.44                     | 0.015            | <T 0.010         | 0.100          | 0.372                    | 0.016            |
| MAR 27,84       | FEB 28,84        | 0.14             | 0.25                     | 0.045            | <T 0.010         | 0.100          | 0.158                    | 0.018            |
| APR 24,84       | MAR 27,84        | *****            | *****                    | *****            | *****            | *****          | *****                    | *****            |
| MAY 22,84       | APR 24,84        | 0.22             | 0.75                     | 0.140            | 0.110            | 0.140          | 0.555                    | 0.025            |
| JUN 19,84       | MAY 22,84        | 0.08             | 0.58                     | 0.050            | 0.165            | B 0.200        | 0.390                    | 0.044            |
| JUL 17,84       | JUN 19,84        | 0.03             | 0.11                     | 0.015            | 0.025            | 0.050          | 0.070                    | <T 0.004         |
| AUG 14,84       | JUL 17,84        | 0.04             | 0.13                     | 0.020            | 0.020            | <W 0.005       | 0.145                    | <T 0.003         |
| SEP 11,84       | AUG 14,84        | 0.04             | 0.28                     | 0.035            | 0.030            | 0.020          | 0.185                    | 0.007            |
| OCT 9,84        | SEP 11,84        | 0.03             | 0.22                     | 0.020            | 0.020            | <T 0.010       | 0.160                    | <T 0.003         |
| NOV 6,84        | OCT 9,84         | 0.06             | 0.26                     | 0.015            | <W 0.005         | <T 0.010       | 0.285                    | <T 0.001         |
| DEC 4,84        | NOV 6,84         | 0.16             | 0.69                     | 0.020            | <W 0.005         | 0.060          | 0.585                    | 0.008            |
| JAN 2,85        | DEC 4,84         | 0.09             | 0.07                     | <T 0.005         | <T 0.010         | 0.035          | 0.045                    | <T 0.003         |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | MANGANSE<br>MG/L | NICKEL<br>MG/L | ZINC<br>MG/L | IRON<br>MG/L | LEAD<br>MG/L | VANADIUM<br>MG/L | ALUMINUM<br>MG/L |
|-----------------|------------------|------------------|----------------|--------------|--------------|--------------|------------------|------------------|
| JAN 31,84       | JAN 3,84         | < 0.001          | 0.007          | < 0.006      | 0.014        | 0.004        | < 0.002          | 0.027            |
| FEB 28,84       | JAN 31,84        | 0.002            | < 0.001        | 0.005        | 0.010        | 0.008        | < 0.002          | 0.036            |
| MAR 27,84       | FEB 28,84        | 0.003            | < 0.001        | 0.006        | 0.039        | 0.005        | < 0.002          | 0.042            |
| APR 24,84       | MAR 27,84        | *****            | *****          | *****        | *****        | *****        | *****            | *****            |
| MAY 22,84       | APR 24,84        | 0.019            | < 0.001        | 0.004        | 0.134        | 0.004        | < 0.002          | 0.184            |
| JUN 19,84       | MAY 22,84        | 0.005            | < 0.001        | < 0.003      | 0.052        | 0.001        | < 0.002          | 0.060            |
| JUL 17,84       | JUN 19,84        | 0.001            | < 0.001        | 0.002        | 0.022        | 0.008        | < 0.002          | 0.025            |
| AUG 14,84       | JUL 17,84        | 0.001            | < 0.001        | 0.002        | 0.016        | 0.004        | < 0.002          | 0.014            |
| SEP 11,84       | AUG 14,84        | 0.003            | < 0.001        | 0.006        | 0.045        | 0.005        | < 0.002          | 0.034            |
| OCT 9,84        | SEP 11,84        | 0.002            | < 0.001        | < 0.004      | 0.025        | 0.003        | < 0.002          | 0.039            |
| NOV 6,84        | OCT 9,84         | < 0.001          | < 0.001        | 0.002        | 0.013        | 0.004        | < 0.002          | 0.021            |
| DEC 4,84        | NOV 6,84         | 0.002            | 0.000          | 0.009        | 0.020        | 0.007        | < 0.000          | 0.026            |
| JAN 2,85        | DEC 4,84         | < 0.001          | < 0.000        | 0.008        | 0.004        | 0.010        | < 0.000          | 0.011            |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

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STATION NAME : DORION/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | COPPER<br>MG/L | CADMIUM<br>MG/L | FREE H+<br>MG/L |
|-----------------|------------------|----------------|-----------------|-----------------|
| JAN 31,84       | JAN 3,84         | < 0.003        | < 0.0001        | 0.0158          |
| FEB 28,84       | JAN 31,84        | < 0.002        | 0.0001          | 0.0741          |
| MAR 27,84       | FEB 28,84        | < 0.003        | < 0.0001        | 0.0295          |
| APR 24,84       | MAR 27,84        | *****          | *****           | *****           |
| MAY 22,84       | APR 24,84        | 0.003          | 0.0001          | 0.0044          |
| JUN 19,84       | MAY 22,84        | < 0.001        | < 0.0001        | 0.0040          |
| JUL 17,84       | JUN 19,84        | 0.001          | < 0.0001        | 0.0107          |
| AUG 14,84       | JUL 17,84        | 0.001          | < 0.0001        | 0.0110          |
| SEP 11,84       | AUG 14,84        | < 0.001        | 0.0001          | 0.0035          |
| OCT 9,84        | SEP 11,84        | < 0.002        | < 0.0001        | 0.0046          |
| NOV 6,84        | OCT 9,84         | 0.002          | 0.0001          | 0.0447          |
| DEC 4,84        | NOV 6,84         | 0.001          | 0.0001          | 0.0468          |
| JAN 2,85        | DEC 4,84         | 0.000          | < 0.0000        | 0.0132          |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : EAR FALL'S/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | SAMPLING<br>START<br>HR. | END<br>HR. | SAMPLE<br>TYPE<br>01-RAIN<br>02-SNOW<br>03-COMP/04-OTHER | GAUGE<br>DEPTH(MM) | GAUGE<br>TYPE<br>00-APIOS<br>09-AES | SAMPLE<br>NUMBER | PROJECT<br>CODE<br>02-APIOS<br>03-SPECIAL | SUBPROJECT<br>CODE<br>01-MOE<br>03-AES | SAMPLER<br>EFFICI-<br>ENCY<br>(%) | COMMENTS<br>FIELD OFFICE |
|-----------------|------------------|--------------------------|------------|--|--------------------|-------------------------------------|------------------|---|--|-----------------------------------|--------------------------|
| JAN 31,84       | JAN 4,84         | 900                      | 900        | 2  | 17.2               | 0                                   | 13565            | 2   | 1                                      | 54                                | C                        |
| FEB 28,84       | JAN 31,84        | 900                      | 910        | 3  | 31.1               | 0                                   | 13566            | 2   | 1                                      | 62                                | C                        |
| MAR 27,84       | FEB 28,84        | 910                      | 905        | 3  | 11.1               | 0                                   | 13567            | 2   | 1                                      | 84                                | CD                       |
| APR 24,84       | MAR 27,84        | 905                      | 850        | 1  | 2.5                | 0                                   | 13569            | 2   | 1                                      | 72                                | C                        |
| MAY 22,84       | APR 24,84        | 850                      | 900        | 1  | 123.6              | 0                                   | 13572            | 2   | 1                                      | 61                                | AC                       |
| JUN 19,84       | MAY 22,84        | 900                      | 900        | 1  | 90.0               | 0                                   | 13574            | 2   | 1                                      | 78                                | CQ                       |
| JUL 17,84       | JUN 19,84        | 900                      | 900        | 1  | 75.0               | 0                                   | 13575            | 2   | 1                                      | U 86                              | CG H                     |
| AUG 14,84       | JUL 17,84        | 900                      | 856        | 1  | 85.0               | 0                                   | 13576            | 2   | 1                                      | 82                                | C HC                     |
| SEP 11,84       | AUG 14,84        | 856                      | 900        | 1  | 43.0               | 0                                   | 13577            | 2   | 1                                      | U 77                              | CQFJ H                   |
| OCT 10,84       | SEP 11,84        | 900                      | 900        | 3  | 37.0               | 0                                   | 13578            | 2   | 1                                      | 64                                | CD                       |
| NOV 8,84        | OCT 10,84        | 900                      | 900        | 3  | 129.7              | 0                                   | 13579            | 2   | 1                                      | U 22                              | CFJ                      |
| DEC 4,84        | NOV 8,84         | 900                      | 900        | 2  | 49.6               | 0                                   | 13580            | 2   | 1                                      | 45                                | N                        |
| JAN 2,85        | DEC 4,84         | 900                      | 900        | 2  | 67.5               | 0                                   | 13581            | 2   | 1                                      | 34                                | C N                      |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | VOLUME<br>ML | CONDUCT.<br>UMHO/CM | PH<br>LAB | TOTAL H+<br>TO PH8.3<br>MG/L | SULPHATE<br>MG/L | NITRATE<br>AS N<br>MG/L | CALCIUM<br>MG/L |
|-----------------|------------------|--------------|---------------------|-----------|------------------------------|------------------|-------------------------|-----------------|
| JAN 31,84       | JAN 4,84         | 307.0        | 11.8                | 4.71      | 0.0380                       | 0.80             | 0.19                    | 0.10            |
| FEB 28,84       | JAN 31,84        | 634.0        | 19.8                | 4.46      | 0.0572                       | 1.55             | 0.55                    | 0.23            |
| MAR 27,84       | FEB 28,84        | 305.0        | 12.0                | 5.03      | 0.0324                       | 1.05             | 0.33                    | 0.21            |
| APR 24,84       | MAR 27,84        | 59.0         | G 37.2              | U 7.37    | 0.0250                       | G 5.80           | 1.03                    | *****           |
| MAY 22,84       | APR 24,84        | 2464.0       | 8.2                 | *****     | 0.0316                       | 1.50             | 0.15                    | 0.57            |
| JUN 19,84       | MAY 22,84        | 2299.0       | 6.5                 | 5.43      | 0.0224                       | 0.95             | 0.20                    | 0.00            |
| JUL 17,84       | JUN 19,84        | 2098.0       | 6.7                 | 5.03      | 0.0248                       | 0.85             | 0.13                    | 0.22            |
| AUG 14,84       | JUL 17,84        | 2276.0       | 7.0                 | 5.10      | 0.0314                       | 0.60             | 0.09                    | 0.08            |
| SEP 11,84       | AUG 14,84        | 1079.0       | 8.8                 | 5.94      | 0.0256                       | 1.40             | 0.29                    | 0.42            |
| OCT 10,84       | SEP 11,84        | 778.0        | 12.8                | U 6.44    | 0.0234                       | 2.10             | 0.44                    | G 0.76          |
| NOV 8,84        | OCT 10,84        | 934.0        | 11.9                | U 4.95    | 0.0380                       | 1.20             | 0.36                    | 0.19            |
| DEC 4,84        | NOV 8,84         | 735.0        | 23.3                | 4.47      | 0.0602                       | 1.65             | 0.58                    | 0.22            |
| JAN 2,85        | DEC 4,84         | 760.0        | 6.3                 | 5.18      | 0.0248                       | 0.40             | 0.17                    | 0.10            |



ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : EAR FALL'S/CUMULATIVE PRECIP.

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PAGE : 2

| REMOVAL<br>DATE | EXPOSURE<br>DATE | CHLORIDE<br>MG/L | KJELDAHL<br>AS N<br>MG/L | MAGNESIM<br>MG/L | POTASSIM<br>MG/L | SODIUM<br>MG/L | AMMONIUM<br>AS N<br>MG/L | PHOSPHOR<br>MG/L |
|-----------------|------------------|------------------|--------------------------|------------------|------------------|----------------|--------------------------|------------------|
| JAN 31,84       | JAN 4,84         | 0.27             | 0.19                     | 0.025            | <T 0.015         | 0.210          | <T 0.002                 | 0.027            |
| FEB 28,84       | JAN 31,84        | 0.14             | 0.37                     | 0.020            | <T 0.010         | 0.115          | 0.322                    | 0.018            |
| MAR 27,84       | FEB 28,84        | 0.27             | *****                    | 0.035            | <T 0.010         | 0.195          | 0.254                    | *****            |
| APR 24,84       | MAR 27,84        | G 0.73           | *****                    | *****            | *****            | *****          | *****                    | *****            |
| MAY 22,84       | APR 24,84        | 0.19             | 0.48                     | 0.105            | 0.070            | 0.135          | 0.200                    | 0.033            |
| JUN 19,84       | MAY 22,84        | 0.04             | 0.37                     | 0.000            | 0.000            | 0.000          | 0.240                    | 0.015            |
| JUL 17,84       | JUN 19,84        | 0.06             | 0.18                     | 0.040            | 0.090            | <W 0.025       | 0.130                    | 0.006            |
| AUG 14,84       | JUL 17,84        | 0.03             | 0.13                     | 0.020            | 0.025            | <W 0.005       | 0.145                    | 0.005            |
| SEP 11,84       | AUG 14,84        | 0.08             | 0.73                     | 0.085            | 0.085            | 0.030          | 0.435                    | 0.030            |
| OCT 10,84       | SEP 11,84        | 0.12             | 0.71                     | 0.075            | 0.080            | 0.055          | 0.600                    | 0.017            |
| NOV 8,84        | OCT 10,84        | 0.08             | 0.39                     | 0.035            | 0.025            | 0.105          | 0.300                    | 0.010            |
| DEC 4,84        | NOV 8,84         | 0.12             | 0.44                     | 0.015            | <W 0.005         | 0.050          | 0.390                    | 0.007            |
| JAN 2,85        | DEC 4,84         | 0.09             | 0.14                     | <T 0.010         | <T 0.010         | 0.045          | 0.090                    | 0.008            |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | MANGANSE<br>MG/L | NICKEL<br>MG/L | ZINC<br>MG/L | IRON<br>MG/L | LEAD<br>MG/L | VANADIUM<br>MG/L | ALUMINUM<br>MG/L |
|-----------------|------------------|------------------|----------------|--------------|--------------|--------------|------------------|------------------|
| JAN 31,84       | JAN 4,84         | 0.002            | 0.002          | 0.010        | 0.039        | 0.005        | < 0.002          | 0.054            |
| FEB 28,84       | JAN 31,84        | 0.002            | < 0.001        | 0.008        | 0.042        | 0.007        | < 0.002          | 0.052            |
| MAR 27,84       | FEB 28,84        | 0.003            | < 0.001        | 0.008        | B 0.212      | 0.006        | < 0.002          | G 0.188          |
| APR 24,84       | MAR 27,84        | *****            | *****          | *****        | *****        | *****        | *****            | *****            |
| MAY 22,84       | APR 24,84        | 0.011            | < 0.001        | 0.003        | 0.239        | 0.006        | < 0.002          | G 0.345          |
| JUN 19,84       | MAY 22,84        | 0.004            | < 0.001        | 0.002        | 0.054        | 0.001        | < 0.002          | 0.055            |
| JUL 17,84       | JUN 19,84        | 0.002            | < 0.001        | < 0.003      | 0.020        | 0.002        | < 0.002          | 0.019            |
| AUG 14,84       | JUL 17,84        | 0.002            | < 0.001        | < 0.003      | 0.016        | 0.003        | < 0.002          | 0.010            |
| SEP 11,84       | AUG 14,84        | 0.009            | < 0.001        | 0.005        | 0.166        | 0.003        | < 0.002          | 0.232            |
| OCT 10,84       | SEP 11,84        | 0.013            | < 0.001        | 0.005        | 0.151        | 0.004        | < 0.002          | 0.203            |
| NOV 8,84        | OCT 10,84        | 0.005            | < 0.001        | 0.009        | D 0.098      | D 0.009      | < 0.002          | 0.073            |
| DEC 4,84        | NOV 8,84         | 0.002            | 0.001          | 0.005        | 0.028        | 0.008        | < 0.000          | 0.034            |
| JAN 2,85        | DEC 4,84         | 0.001            | 0.000          | 0.003        | 0.038        | 0.003        | < 0.000          | 0.020            |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

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STATION NAME : EAR FALL'S/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | COPPER<br>MG/L | CADMIUM<br>MG/L | FREE H+<br>MG/L |
|-----------------|------------------|----------------|-----------------|-----------------|
| JAN 31,84       | JAN 4,84         | < 0.004        | 0.0002          | 0.0195          |
| FEB 28,84       | JAN 31,84        | 0.002          | 0.0002          | 0.0347          |
| MAR 27,84       | FEB 28,84        | < 0.004        | < 0.0001        | 0.0093          |
| APR 24,84       | MAR 27,84        | *****          | *****           | U 0.0000        |
| MAY 22,84       | APR 24,84        | 0.001          | < 0.0001        | *****           |
| JUN 19,84       | MAY 22,84        | 0.001          | 0.0001          | 0.0037          |
| JUL 17,84       | JUN 19,84        | < 0.001        | < 0.0001        | 0.0093          |
| AUG 14,84       | JUL 17,84        | 0.001          | < 0.0001        | 0.0079          |
| SEP 11,84       | AUG 14,84        | 0.001          | 0.0001          | 0.0011          |
| OCT 10,84       | SEP 11,84        | 0.003          | 0.0001          | U 0.0004        |
| NOV 8,84        | OCT 10,84        | U 0.047        | 0.0005          | U 0.0112        |
| DEC 4,84        | NOV 8,84         | 0.002          | 0.0002          | 0.0339          |
| JAN 2,85        | DEC 4,84         | 0.001          | 0.0001          | 0.0066          |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : EXP. LAKES AREA/CUMULATIVE PRECIP. #34

PAGE : 1

| REMOVAL<br>DATE | EXPOSURE<br>DATE | SAMPLING<br>START<br>HR. | SAMPLING<br>END<br>HR. | SAMPLE<br>TYPE<br>01-RAIN<br>02-SNOW<br>03-COMP/04-OTHER | GAUGE<br>DEPTH(MM) | GAUGE<br>TYPE<br>00-APIOS<br>09-AES | SAMPLE<br>NUMBER | PROJECT<br>CODE<br>02-APIOS<br>03-SPECIAL | SUBPROJECT<br>CODE<br>01-MOE<br>03-AES | SAMPLER<br>EFFICI-<br>ENCY<br>(%) | COMMENTS<br>FIELD | OFFICE |
|-----------------|------------------|--------------------------|------------------------|--|--------------------|-------------------------------------|------------------|---|--|-----------------------------------|-------------------|--------|
| JAN 31,84       | JAN 3,84         | 800                      | 815                    | 2  | 25.1               | 9                                   | 13178            | 2   | 1                                      | 35                                | C                 | N      |
| FEB 28,84       | FEB 3,84         | 800                      | 800                    | 3  | 24.3               | 9                                   | 13179            | 2   | 1                                      | 61                                | CF                |        |
| MAR 27,84       | FEB 28,84        | 800                      | 802                    | 3  | 13.0               | 0                                   | 13180            | 2   | 1                                      | 33                                | CD                | N      |
| APR 24,84       | MAR 27,84        | 802                      | 800                    | 1  | 5.2                | 9                                   | 13182            | 2   | 1                                      | 19                                | C                 |        |
| MAY 22,84       | APR 24,84        | 800                      | 800                    | 3  | 49.1               | 0                                   | 13183            | 2   | 1                                      | U 78                              | ACFJ              | HM     |
| JUN 19,84       | MAY 22,84        | 800                      | 800                    | 1  | 82.0               | 0                                   | 13184            | 2   | 1                                      | U 66                              | F C               | H      |
| JUL 17,84       | JUN 19,84        | 800                      | 1000                   | 1  | 72.0               | 0                                   | 13185            | 2   | 1                                      | U 84                              | ADJF              |        |
| AUG 14,84       | JUL 17,84        | 1000                     | 800                    | 1  | 28.0               | 0                                   | 13186            | 2   | 1                                      | 90                                | AC                | H      |
| SEP 11,84       | AUG 14,84        | 800                      | 800                    | 1  | 58.3               | 0                                   | 13187            | 2   | 1                                      | 82                                |                   |        |
| OCT 9,84        | SEP 11,84        | 800                      | 800                    | 3  | 23.9               | 0                                   | 13188            | 2   | 1                                      | U 52                              | CFJ               |        |
| NOV 6,84        | OCT 9,84         | 800                      | 800                    | 3  | 145.3              | 0                                   | 13189            | 2   | 1                                      | U 60                              | CFGJ              | CM     |
| DEC 4,84        | NOV 6,84         | 800                      | 800                    | 3  | 31.3               | 9                                   | 13191            | 2   | 1                                      | 96                                |                   |        |
| JAN 2,85        | DEC 4,84         | 800                      | 800                    | 3  | 41.5               | 0                                   | 13192            | 2   | 1                                      | 40                                |                   | N      |

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | VOLUME<br>ML | CONDUCT.<br>UMHO/CM | PH<br>LAB | TOTAL H+<br>TO PH8.3<br>MG/L | SULPHATE<br>MG/L | NITRATE<br>AS N<br>MG/L | CALCIUM<br>MG/L |
|-----------------|------------------|--------------|---------------------|-----------|------------------------------|------------------|-------------------------|-----------------|
| JAN 31,84       | JAN 3,84         | 287.0        | 11.6                | 4.77      | 0.0410                       | 0.80             | 0.25                    | 0.17            |
| FEB 28,84       | FEB 3,84         | 489.0        | 29.9                | 4.28      | 0.0778                       | 2.70             | D 0.77                  | 0.29            |
| MAR 27,84       | FEB 28,84        | 140.0        | G 43.0              | 4.29      | 0.0926                       | G 5.45           | 0.95                    | 0.63            |
| APR 24,84       | MAR 27,84        | 33.0         | *****               | U 3.65    | U 0.3200                     | *****            | *****                   | *****           |
| MAY 22,84       | APR 24,84        | 1254.0       | 21.5                | U 6.77    | 0.0336                       | 3.10             | 0.42                    | U 2.71          |
| JUN 19,84       | MAY 22,84        | 1781.0       | 8.6                 | 5.47      | 0.0248                       | 1.30             | 0.26                    | 0.30            |
| JUL 17,84       | JUN 19,84        | 1984.0       | 9.7                 | 5.31      | 0.0248                       | D 1.30           | 0.26                    | 0.33            |
| AUG 14,84       | JUL 17,84        | 823.0        | D 13.0              | D 5.90    | D 0.0256                     | 1.70             | D 0.43                  | D 0.54          |
| SEP 11,84       | AUG 14,84        | 1564.0       | 9.5                 | U 6.63    | 0.0238                       | 1.50             | 0.22                    | 0.35            |
| OCT 9,84        | SEP 11,84        | 409.0        | 15.8                | U 6.71    | 0.0246                       | 2.85             | G 0.49                  | U 1.20          |
| NOV 6,84        | OCT 9,84         | 2831.0       | 2.1                 | 5.76      | 0.0184                       | 0.10             | <W 0.01                 | 0.04            |
| DEC 4,84        | NOV 6,84         | 981.0        | 23.9                | 4.82      | 0.0518                       | 2.25             | 0.73                    | D 0.68          |
| JAN 2,85        | DEC 4,84         | 552.0        | 9.8                 | 4.80      | 0.0348                       | 0.60             | 0.19                    | 0.09            |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : EXP. LAKES AREA/CUMULATIVE PRECIP. #34

PAGE : 2

| REMOVAL<br>DATE | EXPOSURE<br>DATE | CHLORIDE<br>MG/L | KJELDAHL<br>AS N<br>MG/L | MAGNESIM<br>MG/L | POTASSIM<br>MG/L | SODIUM<br>MG/L | AMMONIUM<br>AS N<br>MG/L | PHOSPHOR<br>MG/L |
|-----------------|------------------|------------------|--------------------------|------------------|------------------|----------------|--------------------------|------------------|
| JAN 31,84       | JAN 3,84         | 0.15             | 0.21                     | 0.035            | <T 0.015         | 0.150          | 0.030                    | 0.034            |
| FEB 28,84       | FEB 3,84         | 0.15             | D 0.75                   | D 0.030          | 0.020            | 0.165          | D 0.610                  | 0.023            |
| MAR 27,84       | FEB 28,84        | 0.35             | *****                    | G 0.100          | 0.040            | G 0.340        | U 1.240                  | *****            |
| APR 24,84       | MAR 27,84        | *****            | *****                    | *****            | *****            | *****          | *****                    | *****            |
| MAY 22,84       | APR 24,84        | G 0.36           | 1.09                     | U 0.320          | 0.210            | G 0.310        | 0.560                    | 0.081            |
| JUN 19,84       | MAY 22,84        | 0.08             | 0.54                     | 0.045            | 0.110            | 0.035          | 0.365                    | 0.031            |
| JUL 17,84       | JUN 19,84        | 0.05             | D 0.44                   | 0.075            | 0.020            | 0.015          | 0.285                    | 0.010            |
| AUG 14,84       | JUL 17,84        | 0.08             | 0.75                     | D 0.120          | D 0.085          | 0.020          | D 0.560                  | 0.019            |
| SEP 11,84       | AUG 14,84        | 0.06             | 0.81                     | 0.080            | 0.030            | <T 0.010       | G 0.685                  | 0.010            |
| OCT 9,84        | SEP 11,84        | 0.10             | 0.90                     | U 0.220          | 0.115            | 0.040          | 0.595                    | D 0.036          |
| NOV 6,84        | OCT 9,84         | <T 0.02          | 0.07                     | 0.015            | <T 0.010         | <W 0.005       | 0.025                    | <T 0.003         |
| DEC 4,84        | NOV 6,84         | G 0.59           | 1.35                     | D 0.085          | 0.060            | 0.125          | 0.780                    | 0.022            |
| JAN 2,85        | DEC 4,84         | 0.11             | 0.13                     | <T 0.010         | <T 0.005         | 0.065          | 0.030                    | 0.012            |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | MANGANSE<br>MG/L | NICKEL<br>MG/L | ZINC<br>MG/L | IRON<br>MG/L | LEAD<br>MG/L | VANADIUM<br>MG/L | ALUMINUM<br>MG/L |
|-----------------|------------------|------------------|----------------|--------------|--------------|--------------|------------------|------------------|
| JAN 31,84       | JAN 3,84         | 0.002            | 0.004          | 0.011        | 0.031        | 0.004        | < 0.002          | 0.051            |
| FEB 28,84       | FEB 3,84         | 0.005            | < 0.001        | 0.013        | 0.043        | 0.009        | < 0.002          | 0.071            |
| MAR 27,84       | FEB 28,84        | *****            | *****          | *****        | *****        | *****        | *****            | *****            |
| APR 24,84       | MAR 27,84        | *****            | *****          | *****        | *****        | *****        | *****            | *****            |
| MAY 22,84       | APR 24,84        | U 0.048          | 0.001          | 0.014        | U 1.134      | D 0.013      | 0.002            | U 1.622          |
| JUN 19,84       | MAY 22,84        | 0.006            | < 0.001        | 0.004        | 0.065        | 0.001        | < 0.002          | 0.075            |
| JUL 17,84       | JUN 19,84        | 0.005            | < 0.001        | 0.003        | D 0.059      | 0.013        | < 0.002          | 0.052            |
| AUG 14,84       | JUL 17,84        | 0.015            | < 0.001        | < 0.004      | 0.150        | 0.011        | < 0.002          | 0.144            |
| SEP 11,84       | AUG 14,84        | 0.005            | < 0.001        | 0.004        | 0.068        | D 0.015      | < 0.002          | 0.078            |
| OCT 9,84        | SEP 11,84        | U 0.041          | < 0.001        | 0.016        | 0.280        | D 0.017      | < 0.002          | G 0.352          |
| NOV 6,84        | OCT 9,84         | < 0.001          | < 0.001        | < 0.003      | 0.027        | 0.001        | < 0.002          | 0.062            |
| DEC 4,84        | NOV 6,84         | U 0.032          | 0.001          | 0.011        | 0.033        | 0.007        | < 0.000          | 0.077            |
| JAN 2,85        | DEC 4,84         | < 0.001          | < 0.000        | 0.005        | 0.021        | 0.008        | < 0.000          | 0.031            |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

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STATION NAME : EXP. LAKES AREA/CUMULATIVE PRECIP. #34

PAGE : 3

| REMOVAL<br>DATE | EXPOSURE<br>DATE | COPPER<br>MG/L | CADMIUM<br>MG/L | FREE H+<br>MG/L |
|-----------------|------------------|----------------|-----------------|-----------------|
| JAN 31,84       | JAN 3,84         | < 0.004        | 0.0002          | 0.0170          |
| FEB 28,84       | FEB 3,84         | 0.002          | U 0.0012        | 0.0525          |
| MAR 27,84       | FEB 28,84        | *****          | *****           | 0.0513          |
| APR 24,84       | MAR 27,84        | *****          | *****           | U 0.2239        |
| MAY 22,84       | APR 24,84        | 0.003          | 0.0002          | U 0.0002        |
| JUN 19,84       | MAY 22,84        | 0.001          | 0.0001          | 0.0034          |
| JUL 17,84       | JUN 19,84        | < 0.002        | 0.0001          | 0.0049          |
| AUG 14,84       | JUL 17,84        | < 0.002        | < 0.0001        | D 0.0013        |
| SEP 11,84       | AUG 14,84        | < 0.002        | 0.0001          | U 0.0002        |
| OCT 9,84        | SEP 11,84        | < 0.003        | 0.0002          | U 0.0002        |
| NOV 6,84        | OCT 9,84         | < 0.001        | < 0.0001        | 0.0017          |
| DEC 4,84        | NOV 6,84         | 0.002          | U 0.0022        | 0.0151          |
| JAN 2,85        | DEC 4,84         | < 0.001        | 0.0002          | 0.0158          |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : GERALDTON/CUMULATIVE PRECIP.

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PAGE : 1

| REMOVAL<br>DATE | EXPOSURE<br>DATE | SAMPLING<br>START<br>HR. | SAMPLING<br>END<br>HR. | SAMPLE<br>TYPE<br>01-RAIN<br>02-SNOW<br>03-COMP/04-OTHER | GAUGE<br>DEPTH(MM) | GAUGE<br>TYPE<br>00-APIOS<br>09-AES | SAMPLE<br>NUMBER | PROJECT<br>CODE<br>02-APIOS<br>03-SPECIAL | SUBPROJECT<br>CODE<br>01-MOE<br>03-AES | SAMPLER<br>EFFICI-<br>ENCY<br>(%) | COMMENTS<br>FIELD OFFICE |
|-----------------|------------------|--------------------------|------------------------|--|--------------------|-------------------------------------|------------------|---|--|-----------------------------------|--------------------------|
| JAN 31,84       | JAN 3,84         | 1000                     | 1000                   | 2  | 19.1               | 0                                   | 13312            | 2   | 1                                      | 42                                | C NHM                    |
| FEB 28,84       | JAN 31,84        | 1000                     | 935                    | 2  | 20.1               | 0                                   | 13314            | 2   | 1                                      | 72                                | C                        |
| MAR 27,84       | FEB 28,84        | 1000                     | 945                    | 2  | 26.4               | 0                                   | 13315            | 2   | 1                                      | 62                                | CD                       |
| APR 24,84       | MAR 27,84        | 945                      | 1000                   | 1  | 2.3                | 9                                   | 13316            | 2   | 1                                      | 100                               | C                        |
| MAY 22,84       | APR 24,84        | 1000                     | 1000                   | 1  | 73.0               | 9                                   | 13317            | 2   | 1                                      | 59                                | C N                      |
| JUN 19,84       | MAY 22,84        | 1000                     | 1020                   | 1  | 183.6              | 0                                   | 13318            | 2   | 1                                      | U 48                              | CG                       |
| JUL 17,84       | JUN 19,84        | 1020                     | 1015                   | 1  | 143.0              | 0                                   | 13319            | 2   | 1                                      | 78                                | AC                       |
| AUG 14,84       | JUL 17,84        | 1015                     | 915                    | 1  | 97.0               | 0                                   | 13321            | 2   | 1                                      | 69                                | C                        |
| SEP 11,84       | AUG 14,84        | 915                      | 1000                   | 1  | 43.0               | 0                                   | 13322            | 2   | 1                                      | 78                                | A                        |
| OCT 9,84        | SEP 11,84        | 1000                     | 1000                   | 3  | 57.0               | 0                                   | 13323            | 2   | 1                                      | 74                                |                          |
| NOV 6,84        | OCT 9,84         | 1000                     | 900                    | 3  | 69.3               | 9                                   | 13324            | 2   | 1                                      | 65                                | GQ HC                    |
| DEC 4,84        | NOV 6,84         | 900                      | 1100                   | 2  | 48.6               | 0                                   | 13325            | 2   | 1                                      | U 67                              | DFG                      |
| JAN 2,85        | DEC 4,84         | 1100                     | 1320                   | 2  | 91.6               | 0                                   | 13326            | 2   | 1                                      | 67                                |                          |

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | VOLUME<br>ML | CONDUCT.<br>UMHO/CM | PH<br>LAB | TOTAL H+<br>TO PH8.3<br>MG/L | SULPHATE<br>MG/L | NITRATE<br>AS N<br>MG/L | CALCIUM<br>MG/L |
|-----------------|------------------|--------------|---------------------|-----------|------------------------------|------------------|-------------------------|-----------------|
| JAN 31,84       | JAN 3,84         | 262.0        | 5.3                 | 4.95      | 0.0352                       | 0.50             | <W 0.01                 | 0.06            |
| FEB 28,84       | JAN 31,84        | 475.0        | 20.9                | 4.39      | 0.0650                       | 1.70             | 0.49                    | 0.08            |
| MAR 27,84       | FEB 28,84        | 539.0        | 12.0                | 4.72      | 0.0400                       | 1.05             | 0.14                    | 0.12            |
| APR 24,84       | MAR 27,84        | 75.0         | 13.6                | U 6.86    | 0.0202                       | 2.20             | <W 0.01                 | *****           |
| MAY 22,84       | APR 24,84        | 1410.0       | G 33.0              | U *****   | B 0.0598                     | G 3.70           | 0.35                    | U 2.17          |
| JUN 19,84       | MAY 22,84        | 2898.0       | 8.1                 | 4.88      | 0.0336                       | 1.35             | 0.20                    | 0.20            |
| JUL 17,84       | JUN 19,84        | 3629.0       | 4.0                 | 5.15      | 0.0288                       | 0.55             | <W 0.01                 | 0.04            |
| AUG 14,84       | JUL 17,84        | 2190.0       | 8.5                 | 4.96      | 0.0340                       | 0.80             | 0.15                    | 0.13            |
| SEP 11,84       | AUG 14,84        | 1091.0       | 7.4                 | 5.32      | 0.0238                       | 1.05             | 0.16                    | 0.23            |
| OCT 9,84        | SEP 11,84        | 1382.0       | 11.1                | 4.85      | 0.0366                       | 1.40             | 0.15                    | 0.24            |
| NOV 6,84        | OCT 9,84         | 1475.0       | 7.0                 | 5.33      | 0.0306                       | 1.00             | 0.02                    | 0.16            |
| DEC 4,84        | NOV 6,84         | 1063.0       | 22.7                | 4.46      | 0.0648                       | 1.65             | 0.44                    | 0.11            |
| JAN 2,85        | DEC 4,84         | 1995.0       | 8.4                 | 4.83      | *****                        | 0.60             | 0.10                    | <T 0.02         |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : GERALDTON/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | CHLORIDE<br>MG/L | KJELDAHL<br>AS N<br>MG/L | MAGNESIM<br>MG/L | POTASSIM<br>MG/L | SODIUM<br>MG/L | AMMONIUM<br>AS N<br>MG/L | PHOSPHOR<br>MG/L |
|-----------------|------------------|------------------|--------------------------|------------------|------------------|----------------|--------------------------|------------------|
| JAN 31,84       | JAN 3,84         | 0.23             | 0.23                     | 0.015            | <W 0.005         | 0.195          | <W 0.002                 | 0.047            |
| FEB 28,84       | JAN 31,84        | 0.15             | 0.31                     | 0.015            | <T 0.005         | 0.115          | 0.246                    | 0.017            |
| MAR 27,84       | FEB 28,84        | 0.14             | 0.10                     | 0.020            | <W 0.005         | 0.100          | 0.036                    | 0.019            |
| APR 24,84       | MAR 27,84        | G 0.89           | *****                    | *****            | *****            | *****          | *****                    | *****            |
| MAY 22,84       | APR 24,84        | U 0.37           | U 5.75                   | U 0.295          | U 0.375          | U 0.410        | U 2.050                  | U 0.550          |
| JUN 19,84       | MAY 22,84        | 0.07             | 0.34                     | 0.030            | 0.070            | 0.015          | 0.210                    | 0.012            |
| JUL 17,84       | JUN 19,84        | 0.08             | 0.15                     | 0.015            | 0.070            | <W 0.005       | 0.005                    | 0.011            |
| AUG 14,84       | JUL 17,84        | 0.04             | 0.15                     | 0.025            | 0.025            | 0.010          | 0.170                    | 0.006            |
| SEP 11,84       | AUG 14,84        | 0.06             | 0.38                     | 0.040            | 0.020            | <T 0.010       | 0.240                    | 0.008            |
| OCT 9,84        | SEP 11,84        | 0.04             | 0.27                     | 0.020            | <T 0.015         | <T 0.005       | 0.160                    | <T 0.003         |
| NOV 6,84        | OCT 9,84         | 0.06             | D 1.04                   | 0.025            | 0.050            | 0.135          | 0.090                    | 0.010            |
| DEC 4,84        | NOV 6,84         | 0.10             | 0.30                     | 0.010            | 0.020            | 0.025          | 0.270                    | 0.005            |
| JAN 2,85        | DEC 4,84         | 0.06             | 0.06                     | <W 0.005         | <T 0.010         | <W 0.010       | 0.040                    | 0.005            |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | MANGANSE<br>MG/L | NICKEL<br>MG/L | ZINC<br>MG/L | IRON<br>MG/L | LEAD<br>MG/L | VANADIUM<br>MG/L | ALUMINUM<br>MG/L |
|-----------------|------------------|------------------|----------------|--------------|--------------|--------------|------------------|------------------|
| JAN 31,84       | JAN 3,84         | < 0.001          | U 0.026        | < 0.010      | 0.031        | 0.005        | < 0.002          | 0.046            |
| FEB 28,84       | JAN 31,84        | < 0.001          | < 0.001        | 0.004        | 0.018        | 0.003        | < 0.002          | 0.043            |
| MAR 27,84       | FEB 28,84        | < 0.001          | < 0.001        | 0.005        | 0.025        | 0.005        | < 0.002          | 0.033            |
| APR 24,84       | MAR 27,84        | *****            | *****          | *****        | *****        | *****        | *****            | *****            |
| MAY 22,84       | APR 24,84        | 0.006            | < 0.001        | 0.016        | 0.261        | 0.007        | < 0.002          | U 0.330          |
| JUN 19,84       | MAY 22,84        | 0.002            | < 0.001        | < 0.003      | 0.013        | 0.002        | < 0.002          | 0.019            |
| JUL 17,84       | JUN 19,84        | < 0.001          | < 0.001        | < 0.003      | 0.007        | 0.001        | < 0.002          | 0.007            |
| AUG 14,84       | JUL 17,84        | 0.002            | < 0.001        | 0.003        | 0.008        | 0.004        | < 0.002          | 0.008            |
| SEP 11,84       | AUG 14,84        | 0.004            | < 0.001        | 0.006        | 0.032        | 0.002        | < 0.002          | 0.045            |
| OCT 9,84        | SEP 11,84        | 0.003            | < 0.001        | 0.008        | 0.028        | 0.002        | < 0.002          | 0.035            |
| NOV 6,84        | OCT 9,84         | 0.001            | < 0.001        | 0.013        | 0.006        | 0.003        | < 0.002          | 0.026            |
| DEC 4,84        | NOV 6,84         | 0.001            | < 0.000        | 0.006        | 0.014        | 0.007        | < 0.000          | 0.026            |
| JAN 2,85        | DEC 4,84         | < 0.001          | < 0.000        | 0.007        | 0.005        | 0.001        | < 0.000          | 0.007            |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

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STATION NAME : GERALDTON/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | COPPER<br>MG/L | CADMIUM<br>MG/L | FREE H+<br>MG/L |
|-----------------|------------------|----------------|-----------------|-----------------|
| JAN 31,84       | JAN 3,84         | < 0.005        | 0.0001          | 0.0112          |
| FEB 28,84       | JAN 31,84        | 0.003          | 0.0001          | 0.0407          |
| MAR 27,84       | FEB 28,84        | < 0.003        | < 0.0001        | 0.0191          |
| APR 24,84       | MAR 27,84        | *****          | *****           | U 0.0001        |
| MAY 22,84       | APR 24,84        | 0.001          | 0.0003          | U *****         |
| JUN 19,84       | MAY 22,84        | < 0.001        | 0.0001          | 0.0132          |
| JUL 17,84       | JUN 19,84        | 0.001          | < 0.0001        | 0.0071          |
| AUG 14,84       | JUL 17,84        | 0.002          | < 0.0001        | 0.0110          |
| SEP 11,84       | AUG 14,84        | < 0.002        | 0.0001          | 0.0048          |
| OCT 9,84        | SEP 11,84        | < 0.002        | < 0.0001        | 0.0141          |
| NOV 6,84        | OCT 9,84         | < 0.002        | 0.0002          | 0.0047          |
| DEC 4,84        | NOV 6,84         | 0.001          | 0.0001          | 0.0347          |
| JAN 2,85        | DEC 4,84         | 0.000          | < 0.0000        | 0.0148          |



ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : LAC LA CROIX/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | SAMPLING<br>START<br>HR. | SAMPLING<br>END<br>HR. | SAMPLE<br>TYPE<br>01-RAIN<br>02-SNOW<br>03-COMP/04-OTHER | GAUGE<br>DEPTH(MM) | GAUGE<br>TYPE<br>00-APIOS<br>09-AES | SAMPLE<br>NUMBER | PROJECT<br>CODE<br>02-APIOS<br>03-SPECIAL | SUBPROJECT<br>CODE<br>01-MOE<br>03-AES | SAMPLER<br>EFFICI-<br>ENCY<br>(%) | COMMENTS<br>FIELD OFFICE |
|-----------------|------------------|--------------------------|------------------------|--|--------------------|-------------------------------------|------------------|---|--|-----------------------------------|--------------------------|
| JAN 31,84       | JAN 3,84         | 900                      | 900                    | 3  | 11.9               | 0                                   | 95058            | 2   | 1                                      | 68                                | CD                       |
| FEB 28,84       | JAN 31,84        | 900                      | 900                    | 3  | 24.4               | 0                                   | 95057            | 2   | 1                                      | 89                                | CD                       |
| MAR 27,84       | FEB 28,84        | 900                      | 900                    | 2  | 8.3                | 0                                   | 95060            | 2   | 1                                      | 23                                | C N                      |
| APR 24,84       | MAR 27,84        | 900                      | 900                    | 4  | 0.5                | 0                                   | 95061            | 2   | 1                                      | U 0                               | K                        |
| MAY 22,84       | APR 24,84        | 900                      | 800                    | 1  | 52.7               | 0                                   | 95063            | 2   | 1                                      | 82                                | C H                      |
| JUN 19,84       | MAY 22,84        | 900                      | 900                    | 1  | 118.4              | 0                                   | 95064            | 2   | 1                                      | 64                                | C                        |
| JUL 17,84       | JUN 19,84        | 900                      | 900                    | 1  | 85.0               | 0                                   | 95065            | 2   | 1                                      | U 91                              | CG HM                    |
| AUG 14,84       | JUL 17,84        | 900                      | 900                    | 1  | 48.0               | 0                                   | 95067            | 2   | 1                                      | U 19                              | G                        |
| SEP 11,84       | AUG 14,84        | 900                      | 900                    | 1  | 34.0               | 0                                   | 95068            | 2   | 1                                      | U 39                              | BQG                      |
| OCT 9,84        | SEP 11,84        | 900                      | 900                    | 1  | 46.0               | 0                                   | 95069            | 2   | 1                                      | 36                                | BCB N                    |
| NOV 6,84        | OCT 9,84         | 900                      | 900                    | 3  | 59.7               | 0                                   | 95070            | 2   | 1                                      | U 81                              | CF                       |
| JAN 2,85        | NOV 6,84         | 900                      | 900                    | 2  | 95.0               | 0                                   | 95072            | 2   | 1                                      | U 69                              | G H                      |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | VOLUME<br>ML | CONDUCT.<br>UMHO/CM | PH<br>LAB | TOTAL H+<br>TO PH8.3<br>MG/L | SULPHATE<br>MG/L | NITRATE<br>AS N<br>MG/L | CALCIUM<br>MG/L |
|-----------------|------------------|--------------|---------------------|-----------|------------------------------|------------------|-------------------------|-----------------|
| JAN 31,84       | JAN 3,84         | 265.0        | 18.3                | 4.42      | 0.0572                       | 0.85             | 0.42                    | 0.10            |
| FEB 28,84       | JAN 31,84        | 709.0        | 19.5                | 4.46      | 0.0572                       | 1.65             | 0.46                    | 0.20            |
| MAR 27,84       | FEB 28,84        | 63.0         | G 47.7              | 4.05      | G 0.1302                     | 3.15             | G 1.17                  | *****           |
| APR 24,84       | MAR 27,84        | 0.0          | *****               | *****     | *****                        | *****            | *****                   | *****           |
| MAY 22,84       | APR 24,84        | 1410.0       | 12.5                | U 6.38    | 0.0242                       | 2.10             | 0.37                    | U 1.05          |
| JUN 19,84       | MAY 22,84        | 2476.0       | 10.6                | 4.91      | 0.0328                       | 1.40             | 0.28                    | 0.24            |
| JUL 17,84       | JUN 19,84        | 2522.0       | 8.1                 | 5.15      | 0.0328                       | 0.85             | 0.16                    | 0.18            |
| AUG 14,84       | JUL 17,84        | 310.0        | 9.5                 | U 5.05    | 0.0312                       | 1.25             | 0.21                    | 0.20            |
| SEP 11,84       | AUG 14,84        | 436.0        | 5.8                 | U 5.75    | 0.0218                       | 0.80             | 0.18                    | 0.23            |
| OCT 9,84        | SEP 11,84        | 552.0        | 11.3                | 4.75      | 0.0380                       | 1.10             | 0.16                    | 0.13            |
| NOV 6,84        | OCT 9,84         | 1587.0       | 14.2                | U 4.82    | 0.0390                       | 1.60             | 0.34                    | U 0.38          |
| JAN 2,85        | NOV 6,84         | 2135.0       | 18.9                | U 5.93    | *****                        | 0.60             | 0.35                    | 0.10            |

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ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : LAC LA CROIX/CUMULATIVE PRECIP.

#33

PAGE : 2

| REMOVAL<br>DATE | EXPOSURE<br>DATE | CHLORIDE<br>MG/L | KJELDAHL<br>AS N<br>MG/L | MAGNESIM<br>MG/L | POTASSIM<br>MG/L | SODIUM<br>MG/L | AMMONIUM<br>AS N<br>MG/L | PHOSPHOR<br>MG/L |
|-----------------|------------------|------------------|--------------------------|------------------|------------------|----------------|--------------------------|------------------|
| JAN 31,84       | JAN 3,84         | 0.20             | *****                    | 0.020            | <T 0.010         | 0.160          | 0.008                    | *****            |
| FEB 28,84       | JAN 31,84        | 0.10             | 0.30                     | 0.020            | 0.020            | 0.100          | 0.268                    | 0.005            |
| MAR 27,84       | FEB 28,84        | G 0.91           | *****                    | *****            | *****            | *****          | *****                    | *****            |
| APR 24,84       | MAR 27,84        | *****            | *****                    | *****            | *****            | *****          | *****                    | *****            |
| MAY 22,84       | APR 24,84        | 0.19             | 0.67                     | 0.130            | 0.095            | 0.130          | 0.470                    | 0.028            |
| JUN 19,84       | MAY 22,84        | 0.03             | 0.40                     | 0.040            | 0.040            | <W 0.005       | 0.310                    | <T 0.004         |
| JUL 17,84       | JUN 19,84        | 0.04             | 0.18                     | 0.045            | 0.110            | 0.080          | 0.195                    | 0.008            |
| AUG 14,84       | JUL 17,84        | 0.09             | 0.70                     | 0.035            | 0.045            | U 0.045        | 0.265                    | 0.020            |
| SEP 11,84       | AUG 14,84        | 0.09             | 0.81                     | 0.040            | 0.065            | 0.030          | 0.255                    | 0.034            |
| OCT 9,84        | SEP 11,84        | 0.05             | 0.20                     | 0.020            | <T 0.020         | <T 0.015       | 0.100                    | 0.006            |
| NOV 6,84        | OCT 9,84         | 0.07             | 0.36                     | 0.030            | 0.030            | 0.040          | 0.285                    | 0.007            |
| JAN 2,85        | NOV 6,84         | U 2.60           | 0.80                     | 0.045            | U 2.500          | U 1.350        | 0.030                    | 0.019            |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | MANGANSE<br>MG/L | NICKEL<br>MG/L | ZINC<br>MG/L | IRON<br>MG/L | LEAD<br>MG/L | VANADIUM<br>MG/L | ALUMINUM<br>MG/L |
|-----------------|------------------|------------------|----------------|--------------|--------------|--------------|------------------|------------------|
| JAN 31,84       | JAN 3,84         | 0.003            | 0.001          | 0.006        | 0.033        | 0.004        | < 0.002          | 0.048            |
| FEB 28,84       | JAN 31,84        | 0.002            | < 0.001        | 0.006        | 0.024        | 0.004        | < 0.002          | 0.044            |
| MAR 27,84       | FEB 28,84        | *****            | *****          | *****        | *****        | *****        | *****            | *****            |
| APR 24,84       | MAR 27,84        | *****            | *****          | *****        | *****        | *****        | *****            | *****            |
| MAY 22,84       | APR 24,84        | 0.016            | < 0.001        | 0.004        | U 0.399      | 0.005        | < 0.002          | U 0.623          |
| JUN 19,84       | MAY 22,84        | 0.007            | < 0.001        | 0.004        | D 0.183      | D 0.009      | < 0.002          | D 0.195          |
| JUL 17,84       | JUN 19,84        | 0.003            | < 0.001        | < 0.003      | 0.029        | 0.004        | < 0.002          | 0.030            |
| AUG 14,84       | JUL 17,84        | 0.005            | < 0.001        | U 0.027      | 0.099        | 0.006        | < 0.002          | U 0.297          |
| SEP 11,84       | AUG 14,84        | 0.005            | < 0.001        | 0.008        | 0.114        | 0.003        | < 0.002          | U 0.256          |
| OCT 9,84        | SEP 11,84        | 0.002            | < 0.000        | 0.005        | 0.032        | 0.002        | < 0.000          | 0.039            |
| NOV 6,84        | OCT 9,84         | 0.005            | 0.000          | 0.004        | 0.028        | 0.002        | < 0.000          | 0.032            |
| JAN 2,85        | NOV 6,84         | 0.002            | 0.001          | 0.184        | 0.016        | 0.002        | < 0.000          | 0.023            |

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ONTARIO MINISTRY OF THE ENVIRONMENT  
 CUMULATIVE SAMPLING ANALYSIS RESULTS  
 APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

---

STATION NAME : LAC LA CROIX/CUMULATIVE PRECIP.

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PAGE : 3

| REMOVAL<br>DATE | EXPOSURE<br>DATE | COPPER<br>MG/L | CADMIUM<br>MG/L | FREE H+<br>MG/L |
|-----------------|------------------|----------------|-----------------|-----------------|
| JAN 31,84       | JAN 3,84         | < 0.005        | < 0.0001        | 0.0380          |
| FEB 28,84       | JAN 31,84        | 0.002          | 0.0003          | 0.0347          |
| MAR 27,84       | FEB 28,84        | *****          | *****           | 0.0891          |
| APR 24,84       | MAR 27,84        | *****          | *****           | *****           |
| MAY 22,84       | APR 24,84        | 0.001          | < 0.0001        | U 0.0004        |
| JUN 19,84       | MAY 22,84        | 0.004          | 0.0001          | 0.0123          |
| JUL 17,84       | JUN 19,84        | 0.001          | < 0.0001        | 0.0071          |
| AUG 14,84       | JUL 17,84        | < 0.004        | 0.0002          | U 0.0089        |
| SEP 11,84       | AUG 14,84        | < 0.003        | 0.0003          | U 0.0018        |
| OCT 9,84        | SEP 11,84        | < 0.001        | 0.0001          | 0.0178          |
| NOV 6,84        | OCT 9,84         | 0.000          | 0.0001          | U 0.0151        |
| JAN 2,85        | NOV 6,84         | 0.002          | 0.0001          | U 0.0012        |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : OTTER ISLAND/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | SAMPLING<br>START<br>HR. | SAMPLING<br>END<br>HR. | SAMPLE<br>TYPE<br>01-RAIN<br>02-SNOW<br>03-COMP/04-OTHER | GAUGE<br>DEPTH(MM) | GAUGE<br>TYPE<br>00-APIOS<br>09-AES | SAMPLE<br>NUMBER | PROJECT<br>CODE<br>02-APIOS<br>03-SPECIAL | SUBPROJECT<br>CODE<br>01-MOE<br>03-AES | SAMPLER<br>EFFICI-<br>ENCY<br>(%) | COMMENTS<br>FIELD OFFICE |
|-----------------|------------------|--------------------------|------------------------|--|--------------------|-------------------------------------|------------------|---|--|-----------------------------------|--------------------------|
| MAY 22,84       | APR 24,84        | 1250                     | 900                    | 1  | 69.0               | 0                                   | 31001            | 2   | 1                                      | 88                                | C                        |
| JUN 19,84       | MAY 22,84        | 900                      | 900                    | 1  | 102.0              | 0                                   | 31002            | 2   | 1                                      | U 80                              | FJ                       |
| JUL 17,84       | JUN 19,84        | 900                      | 900                    | 1  | 87.0               | 0                                   | 31003            | 2   | 1                                      | U 88                              | ACDFJ                    |
| AUG 14,84       | JUL 17,84        | 900                      | 900                    | 1  | 107.0              | 0                                   | 31004            | 2   | 1                                      | U 80                              | J H                      |
| SEP 11,84       | AUG 14,84        | 900                      | 900                    | 1  | 35.0               | 0                                   | 31005            | 2   | 1                                      | 93                                | C                        |
| OCT 9,84        | SEP 11,84        | 900                      | 900                    | 1  | 80.0               | 0                                   | 31006            | 2   | 1                                      | U 72                              | CDQFJ                    |
| NOV 6,84        | OCT 9,84         | 900                      | 900                    | 3  | 85.0               | 0                                   | 31007            | 2   | 1                                      | U 82                              | AQF                      |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | VOLUME<br>ML | CONDUCT.<br>UMHO/CM | PH<br>LAB | TOTAL H+<br>TO PH8.3<br>MG/L | SULPHATE<br>MG/L | NITRATE<br>AS N<br>MG/L | CALCIUM<br>MG/L |
|-----------------|------------------|--------------|---------------------|-----------|------------------------------|------------------|-------------------------|-----------------|
| MAY 22,84       | APR 24,84        | 1982.0       | 28.4                | 4.66      | 0.0788                       | 4.15             | G 0.64                  | G 0.83          |
| JUN 19,84       | MAY 22,84        | 2680.0       | 20.0                | 4.42      | 0.0576                       | 2.65             | 0.37                    | 0.20            |
| JUL 17,84       | JUN 19,84        | 2499.0       | 10.5                | 4.77      | 0.0416                       | 1.15             | 0.22                    | 0.10            |
| AUG 14,84       | JUL 17,84        | 2806.0       | 9.0                 | G 5.85    | 0.0348                       | 1.55             | 0.14                    | 0.16            |
| SEP 11,84       | AUG 14,84        | 1065.0       | 18.2                | 4.65      | 0.0496                       | 2.40             | 0.25                    | 0.34            |
| OCT 9,84        | SEP 11,84        | 1877.0       | 12.5                | 4.83      | 0.0386                       | 1.55             | 0.16                    | 0.17            |
| NOV 6,84        | OCT 9,84         | 2289.0       | 22.9                | 4.39      | 0.0614                       | 2.15             | 0.40                    | 0.13            |

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ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

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STATION NAME : OTTER ISLAND/CUMULATIVE PRECIP.

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PAGE : 2

| REMOVAL<br>DATE | EXPOSURE<br>DATE | CHLORIDE<br>MG/L | KJELDAHL<br>AS N<br>MG/L | MAGNESIM<br>MG/L | POTASSIM<br>MG/L | SODIUM<br>MG/L | AMMONIUM<br>AS N<br>MG/L | PHOSPHOR<br>MG/L |
|-----------------|------------------|------------------|--------------------------|------------------|------------------|----------------|--------------------------|------------------|
| MAY 22,84       | APR 24,84        | 0.21             | 0.97                     | 0.150            | 0.115            | 0.110          | 0.755                    | 0.028            |
| JUN 19,84       | MAY 22,84        | 0.11             | 0.58                     | 0.040            | 0.090            | 0.040          | 0.400                    | 0.018            |
| JUL 17,84       | JUN 19,84        | 0.05             | 0.33                     | 0.025            | 0.025            | <T 0.010       | 0.195                    | 0.007            |
| AUG 14,84       | JUL 17,84        | D 0.24           | 0.80                     | 0.030            | 0.130            | U 0.865        | 0.145                    | U 0.270          |
| SEP 11,84       | AUG 14,84        | 0.08             | 0.44                     | D 0.050          | 0.045            | 0.015          | 0.315                    | 0.008            |
| OCT 9,84        | SEP 11,84        | 0.05             | 0.29                     | 0.020            | 0.065            | 0.020          | 0.240                    | 0.005            |
| NOV 6,84        | OCT 9,84         | 0.06             | 0.30                     | 0.030            | 0.105            | <T 0.015       | 0.270                    | <T 0.004         |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | MANGANSE<br>MG/L | NICKEL<br>MG/L | ZINC<br>MG/L | IRON<br>MG/L | LEAD<br>MG/L | VANADIUM<br>MG/L | ALUMINUM<br>MG/L |
|-----------------|------------------|------------------|----------------|--------------|--------------|--------------|------------------|------------------|
| MAY 22,84       | APR 24,84        | G 0.016          | < 0.001        | D 0.012      | 0.099        | 0.005        | < 0.002          | 0.140            |
| JUN 19,84       | MAY 22,84        | 0.004            | < 0.001        | 0.004        | 0.032        | 0.001        | < 0.002          | 0.037            |
| JUL 17,84       | JUN 19,84        | 0.002            | < 0.001        | 0.003        | 0.029        | 0.007        | < 0.002          | 0.047            |
| AUG 14,84       | JUL 17,84        | 0.002            | < 0.001        | U 0.049      | 0.035        | 0.009        | < 0.002          | 0.033            |
| SEP 11,84       | AUG 14,84        | 0.007            | < 0.001        | 0.005        | 0.097        | 0.004        | < 0.002          | G 0.188          |
| OCT 9,84        | SEP 11,84        | 0.007            | < 0.001        | 0.003        | 0.026        | 0.003        | < 0.002          | 0.036            |
| NOV 6,84        | OCT 9,84         | 0.008            | < 0.001        | 0.002        | 0.015        | 0.003        | < 0.002          | 0.019            |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

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STATION NAME : OTTER ISLAND/CUMULATIVE PRECIP.

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PAGE : 3

| REMOVAL<br>DATE | EXPOSURE<br>DATE | COPPER<br>MG/L | CADMIUM<br>MG/L | FREE H+<br>MG/L |
|-----------------|------------------|----------------|-----------------|-----------------|
| MAY 22,84       | APR 24,84        | 0.002          | 0.0003          | 0.0219          |
| JUN 19,84       | MAY 22,84        | 0.001          | 0.0001          | 0.0380          |
| JUL 17,84       | JUN 19,84        | 0.001          | 0.0001          | 0.0170          |
| AUG 14,84       | JUL 17,84        | 0.002          | 0.0011          | G 0.0014        |
| SEP 11,84       | AUG 14,84        | < 0.002        | 0.0001          | 0.0224          |
| OCT 9,84        | SEP 11,84        | 0.001          | 0.0001          | 0.0148          |
| NOV 6,84        | OCT 9,84         | < 0.001        | 0.0001          | 0.0407          |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : PICKLE LAKE/CUMULATIVE PRECIP.

#36

PAGE : 1

| REMOVAL<br>DATE | EXPOSURE<br>DATE | SAMPLING<br>START<br>HR. | END<br>HR. | SAMPLE<br>TYPE<br>01-RAIN<br>02-SNOW<br>03-COMP/04-OTHER | GAUGE<br>DEPTH(MM) | GAUGE<br>TYPE<br>00-APIOS<br>09-AES | SAMPLE<br>NUMBER | PROJECT<br>CODE<br>02-APIOS<br>03-SPECIAL | SUBPROJECT<br>CODE<br>01-MOE<br>03-AES | SAMPLER<br>EFFICI-<br>ENCY<br>(%) | COMMENTS<br>FIELD OFFICE |
|-----------------|------------------|--------------------------|------------|--|--------------------|-------------------------------------|------------------|---|--|-----------------------------------|--------------------------|
| JAN 31,84       | JAN 3,84         | 735                      | 740        | 2  | 16.2               | 0                                   | 13813            | 2   | 1                                      | 97                                | C HM                     |
| FEB 28,84       | JAN 31,84        | 740                      | 735        | 2  | 31.2               | 0                                   | 13814            | 2   | 1                                      | 83                                | C                        |
| MAR 27,84       | FEB 28,84        | 735                      | 740        | 2  | 12.1               | 0                                   | 13815            | 2   | 1                                      | 96                                | BCD HC                   |
| APR 24,84       | MAR 27,84        | 740                      | 735        | 1  | 0.8                | 9                                   | 13570            | 2   | 1                                      | 11                                |                          |
| MAY 22,84       | APR 24,84        | 735                      | 730        | 3  | 45.5               | 0                                   | 13816            | 2   | 1                                      | U 85                              | BF                       |
| JUN 19,84       | MAY 22,84        | 800                      | 800        | 1  | 94.0               | 0                                   | 13817            | 2   | 1                                      | 92                                | CQ                       |
| JUL 18,84       | JUN 19,84        | 800                      | 800        | 1  | 68.0               | 0                                   | 13818            | 2   | 1                                      | 91                                | CQ                       |
| SEP 11,84       | JUL 18,84        | 800                      | 1000       | 1  | 110.0              | 0                                   | 13819            | 2   | 1                                      | 85                                | CD                       |
| OCT 9,84        | SEP 11,84        | 1000                     | 1100       | 3  | 70.0               | 0                                   | 13821            | 2   | 1                                      | 86                                | C                        |
| NOV 6,84        | OCT 9,84         | 1100                     | 1045       | 2  | 85.0               | 0                                   | 13822            | 2   | 1                                      | U 42                              | ACQG C                   |
| DEC 4,84        | NOV 6,84         | 1045                     | 1215       | 3  | 50.8               | 0                                   | 13823            | 2   | 1                                      | U 36                              | CFGJ                     |
| JAN 2,85        | DEC 4,84         | 1215                     | 1120       | 2  | 50.0               | 0                                   | 13824            | 2   | 1                                      | U 59                              | FJQ                      |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | VOLUME<br>ML | CONDUCT.<br>UMHO/CM | PH<br>LAB | TOTAL H+<br>TO PH8.3<br>MG/L | SULPHATE<br>MG/L | NITRATE<br>AS N<br>MG/L | CALCIUM<br>MG/L |
|-----------------|------------------|--------------|---------------------|-----------|------------------------------|------------------|-------------------------|-----------------|
| JAN 31,84       | JAN 3,84         | 515.0        | 4.5                 | 5.07      | 0.0272                       | 0.35             | <W 0.01                 | 0.03            |
| FEB 28,84       | JAN 31,84        | 850.0        | 16.0                | 4.54      | 0.0488                       | 1.35             | 0.38                    | 0.20            |
| MAR 27,84       | FEB 28,84        | 379.0        | 6.5                 | G 5.84    | 0.0272                       | 0.45             | 0.05                    | 0.23            |
| APR 24,84       | MAR 27,84        | 3.0          | *****               | *****     | *****                        | *****            | *****                   | *****           |
| MAY 22,84       | APR 24,84        | 1265.0       | 15.4                | *****     | 0.0312                       | 3.40             | 0.28                    | U 1.31          |
| JUN 19,84       | MAY 22,84        | 2818.0       | 7.4                 | 5.75      | 0.0184                       | 1.25             | 0.22                    | 0.30            |
| JUL 18,84       | JUN 19,84        | 2012.0       | 5.1                 | 5.04      | 0.0242                       | 0.50             | 0.08                    | 0.07            |
| SEP 11,84       | JUL 18,84        | 3043.0       | 7.6                 | 5.20      | 0.0260                       | 1.05             | 0.16                    | 0.20            |
| OCT 9,84        | SEP 11,84        | 1973.0       | 9.2                 | 5.09      | 0.0288                       | 1.20             | 0.17                    | 0.26            |
| NOV 6,84        | OCT 9,84         | 1165.0       | 2.5                 | 5.68      | 0.0194                       | 0.10             | <W 0.01                 | 0.05            |
| DEC 4,84        | NOV 6,84         | 598.0        | 12.0                | 5.03      | 0.0334                       | 1.25             | 0.31                    | 0.22            |
| JAN 2,85        | DEC 4,84         | 964.0        | 11.8                | 4.77      | 0.0366                       | 0.85             | 0.21                    | 0.12            |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : PICKLE LAKE/CUMULATIVE PRECIP.

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PAGE : 2

| REMOVAL<br>DATE | EXPOSURE<br>DATE | CHLORIDE<br>MG/L | KJELDAHL<br>AS N<br>MG/L | MAGNESIM<br>MG/L | POTASSIM<br>MG/L | SODIUM<br>MG/L | AMMONIUM<br>AS N<br>MG/L | PHOSPHOR<br>MG/L |
|-----------------|------------------|------------------|--------------------------|------------------|------------------|----------------|--------------------------|------------------|
| JAN 31,84       | JAN 3,84         | 0.09             | 0.06                     | 0.015            | <W 0.005         | 0.080          | <T 0.002                 | 0.014            |
| FEB 28,84       | JAN 31,84        | 0.09             | 0.25                     | 0.020            | <T 0.005         | 0.085          | 0.190                    | 0.009            |
| MAR 27,84       | FEB 28,84        | 0.31             | *****                    | 0.075            | 0.020            | 0.235          | <T 0.002                 | *****            |
| APR 24,84       | MAR 27,84        | *****            | *****                    | *****            | *****            | *****          | *****                    | *****            |
| MAY 22,84       | APR 24,84        | G 0.33           | 0.47                     | U 0.290          | 0.115            | G 0.275        | 0.225                    | 0.036            |
| JUN 19,84       | MAY 22,84        | 0.06             | 0.51                     | 0.060            | 0.135            | <T 0.010       | 0.300                    | 0.033            |
| JUL 18,84       | JUN 19,84        | 0.04             | 0.17                     | 0.010            | 0.015            | 0.010          | 0.045                    | 0.008            |
| SEP 11,84       | JUL 18,84        | 0.06             | 0.38                     | 0.040            | 0.025            | 0.015          | 0.225                    | 0.011            |
| OCT 9,84        | SEP 11,84        | 0.04             | 0.24                     | 0.035            | 0.030            | <W 0.005       | 0.210                    | 0.005            |
| NOV 6,84        | OCT 9,84         | 0.08             | 0.07                     | 0.010            | <W 0.005         | 0.050          | 0.010                    | <T 0.003         |
| DEC 4,84        | NOV 6,84         | 0.35             | G 1.84                   | 0.030            | B 0.235          | B 0.315        | 0.225                    | 0.013            |
| JAN 2,85        | DEC 4,84         | D 0.32           | 0.13                     | D 0.030          | D 0.035          | D 0.180        | 0.070                    | 0.008            |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | MANGANSE<br>MG/L | NICKEL<br>MG/L | ZINC<br>MG/L | IRON<br>MG/L | LEAD<br>MG/L | VANADIUM<br>MG/L | ALUMINUM<br>MG/L |
|-----------------|------------------|------------------|----------------|--------------|--------------|--------------|------------------|------------------|
| JAN 31,84       | JAN 3,84         | 0.002            | 0.002          | < 0.006      | 0.010        | < 0.003      | < 0.002          | 0.023            |
| FEB 28,84       | JAN 31,84        | 0.002            | < 0.001        | 0.005        | 0.022        | 0.006        | < 0.002          | 0.046            |
| MAR 27,84       | FEB 28,84        | 0.011            | < 0.001        | 0.005        | 0.046        | 0.004        | < 0.002          | 0.074            |
| APR 24,84       | MAR 27,84        | *****            | *****          | *****        | *****        | *****        | *****            | *****            |
| MAY 22,84       | APR 24,84        | U 0.022          | < 0.001        | 0.005        | U 0.359      | 0.007        | < 0.002          | U 0.471          |
| JUN 19,84       | MAY 22,84        | 0.006            | < 0.001        | 0.002        | 0.086        | 0.003        | < 0.002          | 0.087            |
| JUL 18,84       | JUN 19,84        | 0.002            | < 0.001        | < 0.003      | 0.020        | 0.002        | < 0.002          | 0.017            |
| SEP 11,84       | JUL 18,84        | 0.004            | < 0.001        | < 0.003      | 0.043        | 0.002        | < 0.002          | 0.050            |
| OCT 9,84        | SEP 11,84        | 0.004            | < 0.001        | 0.004        | 0.034        | 0.003        | < 0.002          | 0.040            |
| NOV 6,84        | OCT 9,84         | < 0.001          | < 0.001        | < 0.004      | 0.017        | 0.001        | < 0.002          | 0.024            |
| DEC 4,84        | NOV 6,84         | 0.004            | 0.001          | 0.011        | 0.048        | 0.006        | < 0.000          | 0.041            |
| JAN 2,85        | DEC 4,84         | 0.002            | 0.000          | 0.005        | 0.026        | 0.009        | < 0.000          | 0.025            |

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ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

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STATION NAME : PICKLE LAKE/CUMULATIVE PRECIP.

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PAGE : 3

| REMOVAL<br>DATE | EXPOSURE<br>DATE | COPPER<br>MG/L | CADMIUM<br>MG/L | FREE H+<br>MG/L |
|-----------------|------------------|----------------|-----------------|-----------------|
| JAN 31,84       | JAN 3,84         | < 0.003        | < 0.0001        | 0.0085          |
| FEB 28,84       | JAN 31,84        | 0.002          | 0.0001          | 0.0288          |
| MAR 27,84       | FEB 28,84        | < 0.004        | < 0.0001        | G 0.0014        |
| APR 24,84       | MAR 27,84        | *****          | *****           | *****           |
| MAY 22,84       | APR 24,84        | 0.001          | 0.0001          | *****           |
| JUN 19,84       | MAY 22,84        | 0.001          | < 0.0001        | 0.0018          |
| JUL 18,84       | JUN 19,84        | < 0.001        | < 0.0001        | 0.0091          |
| SEP 11,84       | JUL 18,84        | < 0.001        | < 0.0001        | 0.0063          |
| OCT 9,84        | SEP 11,84        | 0.001          | 0.0001          | 0.0081          |
| NOV 6,84        | OCT 9,84         | < 0.002        | < 0.0001        | 0.0021          |
| DEC 4,84        | NOV 6,84         | 0.003          | 0.0001          | 0.0093          |
| JAN 2,85        | DEC 4,84         | 0.001          | 0.0001          | 0.0170          |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : QUETICO CENTRE/CUMULATIVE PRECIP. #32

PAGE : 1

| REMOVAL<br>DATE | EXPOSURE<br>DATE | SAMPLING<br>START<br>HR. | END<br>HR. | SAMPLE<br>TYPE<br>01-RAIN<br>02-SNOW<br>03-COMP/04-OTHER | GAUGE<br>DEPTH(MM) | GAUGE<br>TYPE<br>00-APIOS<br>09-AES | SAMPLE<br>NUMBER | PROJECT<br>CODE<br>02-APIOS<br>03-SPECIAL | SUBPROJECT<br>CODE<br>01-MOE<br>03-AES | SAMPLER<br>EFFICI-<br>ENCY<br>(%) | COMMENTS<br>FIELD OFFICE |
|-----------------|------------------|--------------------------|------------|--|--------------------|-------------------------------------|------------------|---|--|-----------------------------------|--------------------------|
| JAN 31,84       | JAN 3,84         | 900                      | 900        | 2  | 18.4               | 0                                   | 95055            | 2   | 1                                      | 54                                | C HM                     |
| FEB 28,84       | JAN 31,84        | 900                      | 900        | 3  | 32.9               | 0                                   | 95250            | 2   | 1                                      | U 46                              | FIM                      |
| MAR 28,84       | FEB 28,84        | 900                      | 900        | 3  | 5.8                | 0                                   | 95252            | 2   | 1                                      | 54                                | CD                       |
| APR 24,84       | MAR 28,84        | 900                      | 900        | 4  | *****              | *                                   | 95253            | 2   | 1                                      | ***                               | K                        |
| MAY 22,84       | APR 24,84        | 900                      | 900        | 3  | 98.5               | 0                                   | 95255            | 2   | 1                                      | 83                                | C                        |
| JUN 19,84       | MAY 22,84        | 900                      | 800        | 1  | 87.8               | 9                                   | 95257            | 2   | 1                                      | 90                                | C                        |
| JUL 17,84       | JUN 19,84        | 800                      | 800        | 1  | 103.7              | 0                                   | 95258            | 2   | 1                                      | 96                                | C                        |
| AUG 14,84       | JUL 17,84        | 800                      | 800        | 1  | 99.2               | 0                                   | 95260            | 2   | 1                                      | 87                                | CA H                     |
| SEP 11,84       | AUG 14,84        | 800                      | 800        | 1  | 51.6               | 0                                   | 95261            | 2   | 1                                      | 102                               | AC                       |
| OCT 9,84        | SEP 11,84        | 800                      | 800        | 3  | 23.3               | 9                                   | 95263            | 2   | 1                                      | 97                                | C                        |
| NOV 7,84        | OCT 9,84         | 800                      | 800        | 3  | 76.8               | 0                                   | 95264            | 2   | 1                                      | 93                                | BC                       |
| DEC 4,84        | NOV 7,84         | 800                      | 900        | 3  | 41.8               | 0                                   | 95265            | 2   | 1                                      | 82                                |                          |
| JAN 2,85        | DEC 4,84         | 900                      | 900        | 3  | 65.4               | 0                                   | 95267            | 2   | 1                                      | 91                                | C M                      |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | VOLUME<br>ML | CONDUCT.<br>UMHO/CM | PH<br>LAB | TOTAL H+<br>TO PH8.3<br>MG/L | SULPHATE<br>MG/L | NITRATE<br>AS N<br>MG/L | CALCIUM<br>MG/L |
|-----------------|------------------|--------------|---------------------|-----------|------------------------------|------------------|-------------------------|-----------------|
| JAN 31,84       | JAN 3,84         | 325.0        | 10.4                | 4.73      | 0.0496                       | 0.85             | <W 0.01                 | 0.12            |
| FEB 28,84       | JAN 31,84        | 499.0        | 19.9                | 4.46      | 0.0568                       | 1.40             | 0.53                    | 0.16            |
| MAR 28,84       | FEB 28,84        | 102.0        | 28.4                | 4.43      | 0.0730                       | 2.55             | 0.72                    | 0.45            |
| APR 24,84       | MAR 28,84        | 0.0          | *****               | *****     | *****                        | *****            | *****                   | *****           |
| MAY 22,84       | APR 24,84        | 2657.0       | 8.2                 | 6.02      | 0.0282                       | 1.40             | 0.21                    | 0.53            |
| JUN 19,84       | MAY 22,84        | 2567.0       | 6.0                 | 5.16      | 0.0244                       | 0.90             | 0.20                    | 0.20            |
| JUL 17,84       | JUN 19,84        | 3265.0       | 6.5                 | 5.20      | 0.0300                       | 0.70             | 0.15                    | 0.13            |
| AUG 14,84       | JUL 17,84        | 2821.0       | 9.5                 | 5.02      | 0.0328                       | 0.95             | 0.15                    | 0.15            |
| SEP 11,84       | AUG 14,84        | 1717.0       | 9.4                 | 5.11      | 0.0294                       | 1.40             | 0.20                    | 0.25            |
| OCT 9,84        | SEP 11,84        | 738.0        | 10.5                | 5.22      | 0.0302                       | 1.50             | 0.22                    | 0.29            |
| NOV 7,84        | OCT 9,84         | 2343.0       | 11.5                | 4.79      | 0.0396                       | 1.00             | 0.17                    | 0.12            |
| DEC 4,84        | NOV 7,84         | 1113.0       | 16.7                | 4.71      | 0.0424                       | 1.45             | 0.45                    | 0.27            |
| JAN 2,85        | DEC 4,84         | 1936.0       | 6.8                 | 4.98      | 0.0276                       | 0.40             | 0.11                    | <T 0.03         |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

STATION NAME : QUETICO CENTRE/CUMULATIVE PRECIP.

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PAGE : 2

| REMOVAL<br>DATE | EXPOSURE<br>DATE | CHLORIDE<br>MG/L | KJELDAHL<br>AS N<br>MG/L | MAGNESIM<br>MG/L | POTASSIM<br>MG/L | SODIUM<br>MG/L | AMMONIUM<br>AS N<br>MG/L | PHOSPHOR<br>MG/L |
|-----------------|------------------|------------------|--------------------------|------------------|------------------|----------------|--------------------------|------------------|
| JAN 31,84       | JAN 3,84         | U 1.05           | 0.30                     | 0.030            | <T 0.010         | U 0.785        | D 0.070                  | U 0.130          |
| FEB 28,84       | JAN 31,84        | 0.18             | 0.42                     | 0.015            | <T 0.015         | 0.155          | 0.328                    | 0.026            |
| MAR 28,84       | FEB 28,84        | G 0.57           | *****                    | 0.080            | D 0.085          | G 0.480        | 0.400                    | *****            |
| APR 24,84       | MAR 28,84        | *****            | *****                    | *****            | *****            | *****          | *****                    | *****            |
| MAY 22,84       | APR 24,84        | 0.11             | 0.51                     | 0.080            | 0.055            | 0.070          | 0.180                    | 0.022            |
| JUN 19,84       | MAY 22,84        | 0.11             | 0.42                     | 0.025            | 0.050            | 0.020          | 0.200                    | 0.009            |
| JUL 17,84       | JUN 19,84        | 0.03             | 0.26                     | 0.020            | 0.010            | <W 0.005       | 0.185                    | <T 0.003         |
| AUG 14,84       | JUL 17,84        | 0.04             | 0.24                     | 0.040            | 0.025            | <W 0.005       | 0.230                    | 0.009            |
| SEP 11,84       | AUG 14,84        | 0.06             | 0.42                     | 0.040            | 0.030            | 0.020          | 0.320                    | 0.006            |
| OCT 9,84        | SEP 11,84        | 0.05             | 0.39                     | 0.045            | 0.045            | 0.020          | 0.325                    | <T 0.003         |
| NOV 7,84        | OCT 9,84         | 0.05             | 0.18                     | 0.015            | <T 0.010         | <T 0.010       | 0.145                    | 0.005            |
| DEC 4,84        | NOV 7,84         | 0.09             | 0.42                     | 0.020            | <W 0.005         | 0.045          | 0.380                    | 0.005            |
| JAN 2,85        | DEC 4,84         | 0.06             | 0.06                     | <T 0.005         | <T 0.010         | 0.030          | 0.030                    | <T 0.003         |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | MANGANSE<br>MG/L | NICKEL<br>MG/L | ZINC<br>MG/L | IRON<br>MG/L | LEAD<br>MG/L | VANADIUM<br>MG/L | ALUMINUM<br>MG/L |
|-----------------|------------------|------------------|----------------|--------------|--------------|--------------|------------------|------------------|
| JAN 31,84       | JAN 3,84         | 0.002            | < 0.001        | 0.005        | 0.036        | 0.005        | < 0.002          | B 0.156          |
| FEB 28,84       | JAN 31,84        | 0.002            | < 0.001        | 0.010        | 0.024        | 0.007        | < 0.002          | 0.059            |
| MAR 28,84       | FEB 28,84        | *****            | *****          | *****        | *****        | *****        | *****            | *****            |
| APR 24,84       | MAR 28,84        | *****            | *****          | *****        | *****        | *****        | *****            | *****            |
| MAY 22,84       | APR 24,84        | 0.014            | < 0.001        | 0.003        | 0.257        | 0.002        | < 0.002          | U 0.354          |
| JUN 19,84       | MAY 22,84        | 0.004            | < 0.001        | < 0.003      | 0.070        | 0.004        | < 0.002          | 0.082            |
| JUL 17,84       | JUN 19,84        | 0.002            | < 0.001        | < 0.003      | 0.028        | 0.007        | < 0.002          | 0.021            |
| AUG 14,84       | JUL 17,84        | 0.003            | < 0.001        | < 0.003      | 0.025        | 0.002        | < 0.002          | 0.020            |
| SEP 11,84       | AUG 14,84        | 0.004            | < 0.001        | < 0.003      | 0.045        | 0.006        | < 0.002          | 0.022            |
| OCT 9,84        | SEP 11,84        | 0.006            | < 0.001        | < 0.005      | 0.051        | 0.002        | < 0.002          | 0.076            |
| NOV 7,84        | OCT 9,84         | 0.003            | < 0.001        | 0.002        | 0.017        | 0.001        | < 0.002          | 0.018            |
| DEC 4,84        | NOV 7,84         | 0.005            | 0.000          | 0.003        | 0.051        | 0.002        | < 0.000          | 0.065            |
| JAN 2,85        | DEC 4,84         | < 0.001          | < 0.000        | < 0.003      | 0.009        | 0.002        | < 0.000          | 0.007            |

ONTARIO MINISTRY OF THE ENVIRONMENT  
CUMULATIVE SAMPLING ANALYSIS RESULTS  
APIOS - ACIDIC PRECIPITATION IN ONTARIO STUDY

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STATION NAME : QUETICO CENTRE/CUMULATIVE PRECIP.

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PAGE : 3

| REMOVAL<br>DATE | EXPOSURE<br>DATE | COPPER<br>MG/L | CADMIUM<br>MG/L | FREE H+<br>MG/L |
|-----------------|------------------|----------------|-----------------|-----------------|
| JAN 31,84       | JAN 3,84         | < 0.004        | < 0.0001        | 0.0186          |
| FEB 28,84       | JAN 31,84        | 0.004          | 0.0003          | 0.0347          |
| MAR 28,84       | FEB 28,84        | *****          | *****           | 0.0372          |
| APR 24,84       | MAR 28,84        | *****          | *****           | *****           |
| MAY 22,84       | APR 24,84        | 0.001          | 0.0001          | 0.0010          |
| JUN 19,84       | MAY 22,84        | < 0.001        | < 0.0001        | 0.0069          |
| JUL 17,84       | JUN 19,84        | 0.001          | < 0.0001        | 0.0063          |
| AUG 14,84       | JUL 17,84        | < 0.001        | < 0.0001        | 0.0095          |
| SEP 11,84       | AUG 14,84        | < 0.002        | 0.0001          | 0.0078          |
| OCT 9,84        | SEP 11,84        | < 0.002        | 0.0001          | 0.0060          |
| NOV 7,84        | OCT 9,84         | < 0.001        | 0.0001          | 0.0162          |
| DEC 4,84        | NOV 7,84         | 0.000          | 0.0004          | 0.0195          |
| JAN 2,85        | DEC 4,84         | 0.000          | 0.0000          | 0.0105          |

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ONTARIO MINISTRY OF THE ENVIRONMENT  
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STATION NAME : WINISK/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | SAMPLING<br>START<br>HR. | SAMPLING<br>END<br>HR. | SAMPLE<br>TYPE<br>01-RAIN<br>02-SNOW<br>03-COMP/04-OTHER | GAUGE<br>DEPTH(MM) | GAUGE<br>TYPE<br>00-APIOS<br>09-AES | SAMPLE<br>NUMBER | PROJECT<br>CODE<br>02-APIOS<br>03-SPECIAL | SUBPROJECT<br>CODE<br>01-MOE<br>03-AES | SAMPLER<br>EFFICI-<br>ENCY<br>(%) | COMMENTS<br>FIELD OFFICE |
|-----------------|------------------|--------------------------|------------------------|--|--------------------|-------------------------------------|------------------|---|--|-----------------------------------|--------------------------|
| JAN 31,84       | JAN 4,84         | 1015                     | 1500                   | 2  | 18.2               | 9                                   | 11784            | 2   | 1                                      | 8                                 |                          |
| FEB 28,84       | JAN 31,84        | 1500                     | 1100                   | 2  | 24.6               | 9                                   | 11801            | 2   | 1                                      | 0                                 | G                        |
| MAR 27,84       | FEB 28,84        | 1100                     | 1100                   | 3  | 33.7               | 9                                   | 11816            | 2   | 1                                      | 7                                 |                          |
| MAY 22,84       | MAR 27,84        | 1100                     | 1100                   | 1  | 24.8               | 9                                   | 11829            | 2   | 1                                      | 96                                | A C                      |
| JUN 22,84       | MAY 22,84        | 1100                     | 1100                   | 1  | 120.1              | 9                                   | 11866            | 2   | 1                                      | 0                                 | EG                       |
| JUL 30,84       | JUN 22,84        | 1100                     | 1700                   | 1  | 149.2              | 9                                   | 38319            | 2   | 1                                      | 43                                | ACQJ M                   |
| SEP 26,84       | JUL 30,84        | 1700                     | 1030                   | 3  | 98.6               | 9                                   | 35233            | 2   | 1                                      | 107                               | CD                       |
| NOV 7,84        | SEP 26,84        | 1030                     | 1100                   | 3  | 41.5               | 9                                   | 35258            | 2   | 1                                      | 100                               | C                        |
| DEC 18,84       | NOV 7,84         | 1100                     | 2230                   | 2  | 96.2               | 9                                   | 35309            | 2   | 1                                      | 36                                | H                        |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | VOLUME<br>ML | CONDUCT.<br>UMHO/CM | PH<br>LAB | TOTAL H+<br>TO PH8.3<br>MG/L | SULPHATE<br>MG/L | NITRATE<br>AS N<br>MG/L | CALCIUM<br>MG/L |
|-----------------|------------------|--------------|---------------------|-----------|------------------------------|------------------|-------------------------|-----------------|
| JAN 31,84       | JAN 4,84         | 52.0         | *****               | U 7.55    | 0.0136                       | *****            | *****                   | *****           |
| FEB 28,84       | JAN 31,84        | 0.0          | *****               | *****     | *****                        | *****            | *****                   | *****           |
| MAR 27,84       | FEB 28,84        | 78.0         | 43.5                | U 7.24    | 0.0184                       | U 6.30           | 0.38                    | *****           |
| MAY 22,84       | MAR 27,84        | 779.0        | 29.5                | U 7.47    | 0.0210                       | G 4.00           | 0.36                    | U 3.05          |
| JUN 22,84       | MAY 22,84        | 0.0          | *****               | *****     | *****                        | *****            | *****                   | *****           |
| JUL 30,84       | JUN 22,84        | 2090.0       | 8.7                 | 6.77      | 0.0184                       | 0.85             | 0.11                    | 0.71            |
| SEP 26,84       | JUL 30,84        | 3439.0       | 19.6                | 5.04      | 0.0366                       | 1.30             | 0.09                    | 0.19            |
| NOV 7,84        | SEP 26,84        | 1348.0       | 18.2                | 5.40      | 0.0204                       | 1.15             | 0.14                    | 0.30            |
| DEC 18,84       | NOV 7,84         | 1146.0       | 29.7                | 4.85      | 0.0346                       | 1.70             | 0.20                    | 0.40            |

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | CHLORIDE<br>MG/L | KJELDAHL<br>AS N<br>MG/L | MAGNESIM<br>MG/L | POTASSIM<br>MG/L | SODIUM<br>MG/L | AMMONIUM<br>AS N<br>MG/L | PHOSPHOR<br>MG/L |
|-----------------|------------------|------------------|--------------------------|------------------|------------------|----------------|--------------------------|------------------|
| JAN 31,84       | JAN 4,84         | *****            | 0.38                     | *****            | *****            | *****          | *****                    | 0.013            |
| FEB 28,84       | JAN 31,84        | *****            | *****                    | *****            | *****            | *****          | *****                    | *****            |
| MAR 27,84       | FEB 28,84        | U 4.60           | *****                    | *****            | *****            | *****          | *****                    | *****            |
| MAY 22,84       | MAR 27,84        | 0.51             | 0.62                     | U 0.425          | 0.180            | 0.340          | 0.435                    | 0.017            |
| JUN 22,84       | MAY 22,84        | *****            | *****                    | *****            | *****            | *****          | *****                    | *****            |
| JUL 30,84       | JUN 22,84        | 0.25             | 0.76                     | 0.120            | 0.030            | 0.045          | 0.415                    | 0.058            |
| SEP 26,84       | JUL 30,84        | U 2.87           | 0.18                     | 0.230            | 0.110            | U 1.000        | 0.085                    | 0.007            |
| NOV 7,84        | SEP 26,84        | U 2.81           | 0.18                     | 0.235            | 0.075            | U 1.580        | 0.080                    | 0.005            |
| DEC 18,84       | NOV 7,84         | U 4.85           | 0.15                     | 0.400            | 0.110            | U 2.900        | 0.025                    | 0.009            |

| REMOVAL<br>DATE | EXPOSURE<br>DATE | MANGANSE<br>MG/L | NICKEL<br>MG/L | ZINC<br>MG/L | IRON<br>MG/L | LEAD<br>MG/L | VANADIUM<br>MG/L | ALUMINUM<br>MG/L |
|-----------------|------------------|------------------|----------------|--------------|--------------|--------------|------------------|------------------|
| JAN 31,84       | JAN 4,84         | *****            | *****          | *****        | *****        | *****        | *****            | *****            |
| FEB 28,84       | JAN 31,84        | *****            | *****          | *****        | *****        | *****        | *****            | *****            |
| MAR 27,84       | FEB 28,84        | *****            | *****          | *****        | *****        | *****        | *****            | *****            |
| MAY 22,84       | MAR 27,84        | U 0.012          | < 0.001        | 0.007        | U 0.488      | 0.012        | < 0.002          | U 0.607          |
| JUN 22,84       | MAY 22,84        | *****            | *****          | *****        | *****        | *****        | *****            | *****            |
| JUL 30,84       | JUN 22,84        | 0.002            | < 0.001        | 0.002        | 0.032        | 0.002        | < 0.002          | 0.035            |
| SEP 26,84       | JUL 30,84        | 0.002            | < 0.001        | 0.003        | 0.008        | 0.002        | < 0.002          | 0.012            |
| NOV 7,84        | SEP 26,84        | < 0.001          | < 0.001        | 0.005        | 0.023        | 0.004        | < 0.002          | 0.018            |
| DEC 18,84       | NOV 7,84         | < 0.001          | 0.001          | 0.007        | 0.027        | 0.007        | < 0.000          | 0.022            |

ONTARIO MINISTRY OF THE ENVIRONMENT  
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STATION NAME : WINISK/CUMULATIVE PRECIP.

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| REMOVAL<br>DATE | EXPOSURE<br>DATE | COPPER<br>MG/L | CADMIUM<br>MG/L | FREE H+<br>MG/L |
|-----------------|------------------|----------------|-----------------|-----------------|
| JAN 31,84       | JAN 4,84         | *****          | *****           | U 0.0000        |
| FEB 28,84       | JAN 31,84        | *****          | *****           | *****           |
| MAR 27,84       | FEB 28,84        | *****          | *****           | U 0.0001        |
| MAY 22,84       | MAR 27,84        | < 0.002        | < 0.0001        | U 0.0000        |
| JUN 22,84       | MAY 22,84        | *****          | *****           | *****           |
| JUL 30,84       | JUN 22,84        | 0.001          | 0.0001          | 0.0002          |
| SEP 26,84       | JUL 30,84        | 0.001          | 0.0001          | 0.0091          |
| NOV 7,84        | SEP 26,84        | < 0.002        | 0.0002          | 0.0040          |
| DEC 18,84       | NOV 7,84         | 0.003          | 0.0004          | 0.0141          |

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